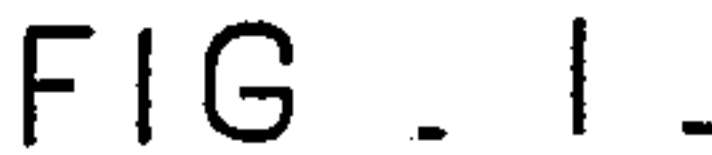


2 Sheets—Sheet 1.

No. 494,610.

Patented Apr. 4, 1893.



Attest:
Geo. T. Smallwood.
Geo. E. Bruce

George W. Webb.
By Knight Bros. Attys.

G. W. WEBB.
ELECTRIC SWITCH.

No. 494,610.

Patented Apr. 4, 1893.

FIG. IV.

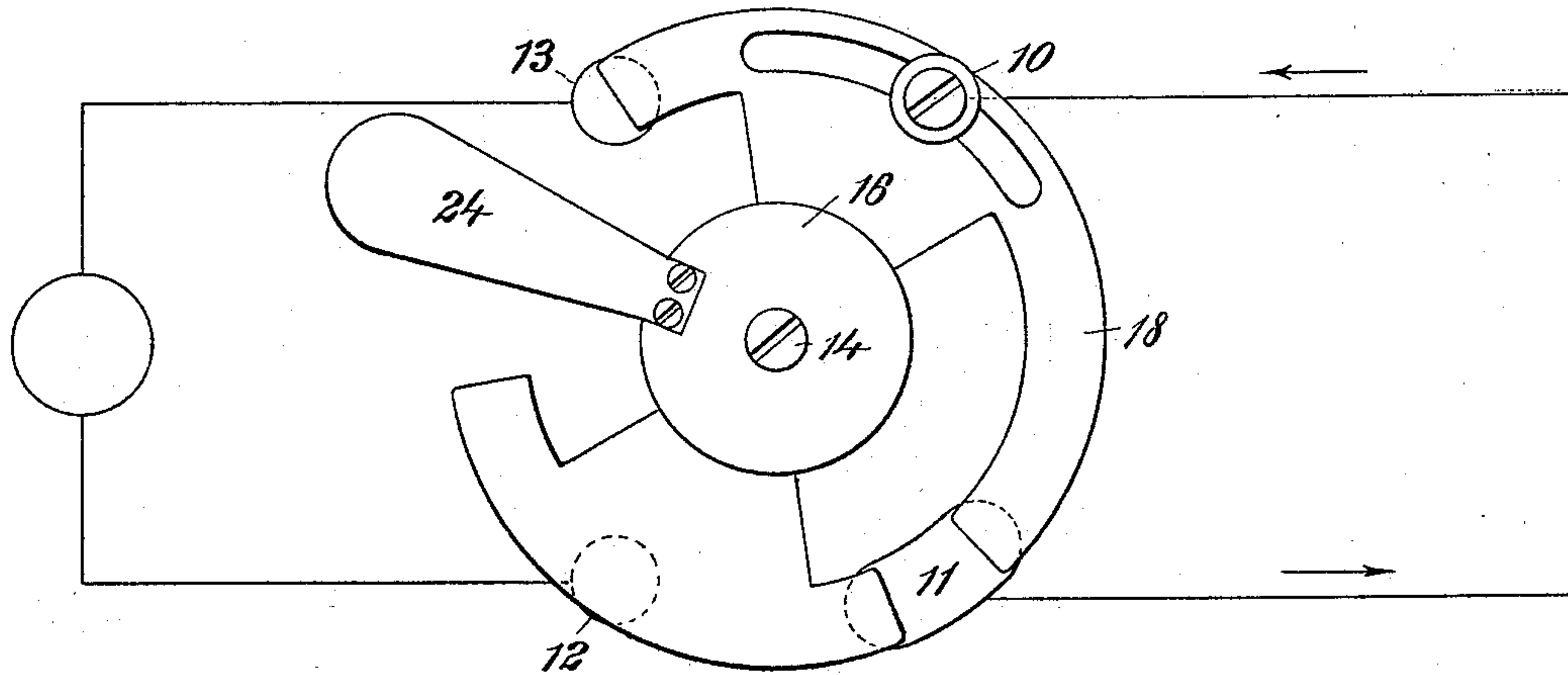


FIG. V.

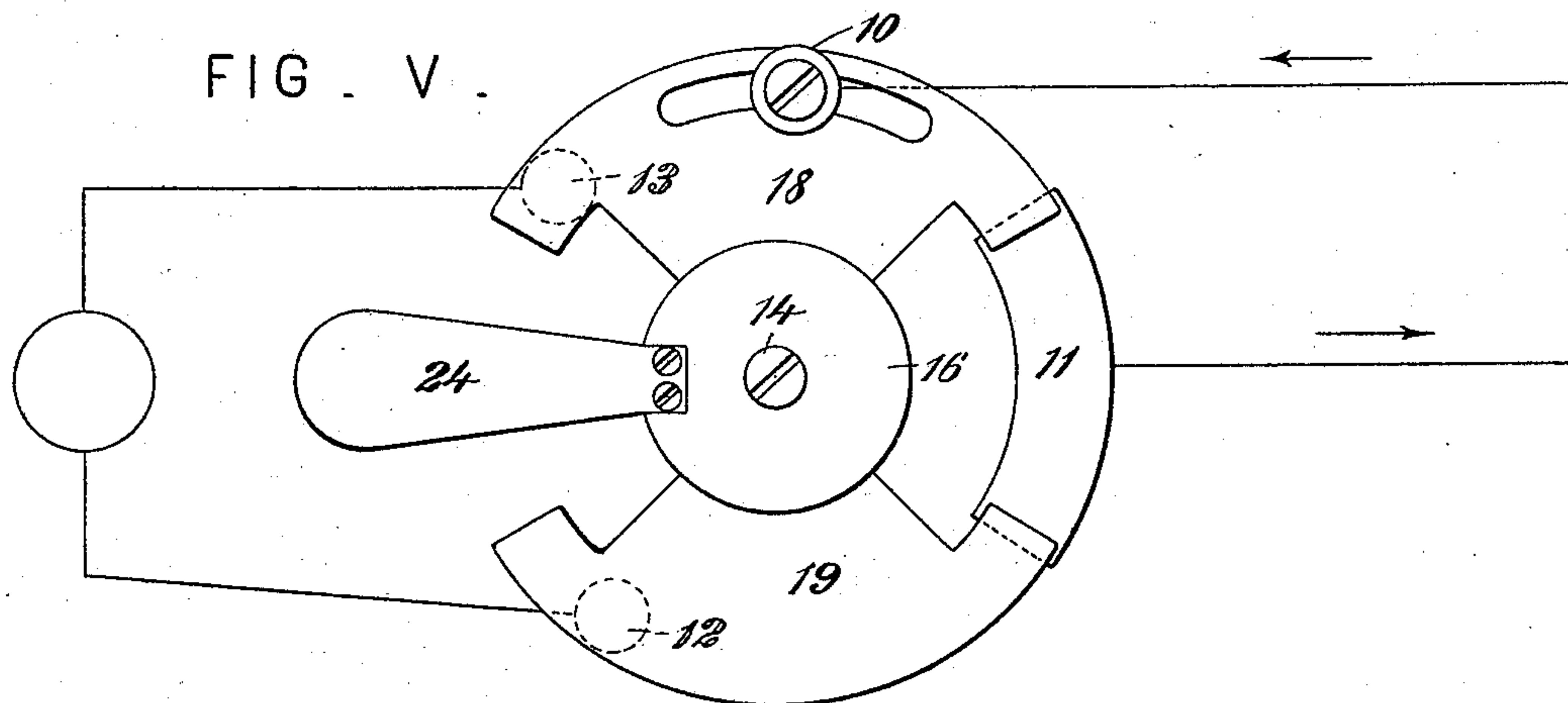
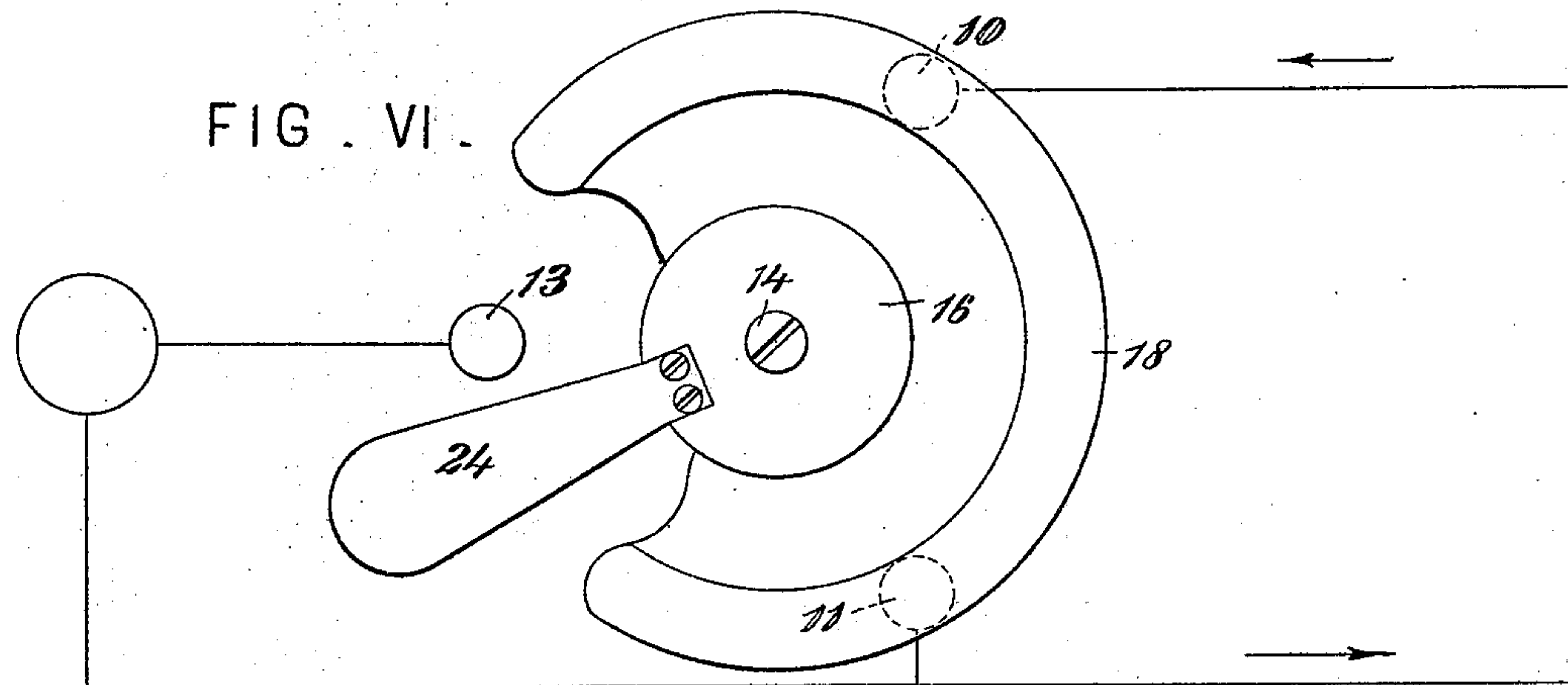


FIG. VI.



Attest: { Geo. T. Smallwood,
Geo. E. Cruise.

Inventor:
George W. Webb.
By Knight Bros. Atty.

UNITED STATES PATENT OFFICE.

GEORGE WASHINGTON WEBB, OF WILKES-BARRÉ, PENNSYLVANIA, ASSIGNOR
OF ONE-HALF TO WALTER GASTON, OF SAME PLACE.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 494,610, dated April 4, 1893.

Application filed April 20, 1892. Serial No. 429,943. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WASHINGTON WEBB, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne, in the State of Pennsylvania, have invented a new and Improved Electric Switch, of which the following is a specification.

My invention relates to a switch designed for use in connection with conductors for high tension currents and which will operate first, to open a feed or line-wire and throw into connection therewith an arc lamp or other translating device, or to throw said translating device out of connection and simultaneously close the breach in the line, and secondly, to keep the line closed, until the change is effected, or to close the line first and then cut out the lamp, so that at no time is the circuit broken, and thus result in a total avoidance of arcing or destructive sparking.

In carrying out my invention and maintaining the closed circuit on the line until the circuit through the lamp is completed, or maintaining the circuit through the lamp until the circuit on the line is again closed, I use four symmetrically arranged contacts, which, for convenience I shall designate as "lamp-contacts" and "line-contacts," and two segmental bridge-plate or plates having arcuate outer edges and mounted on a central disk of insulating material for spanning the spaces between the contacts, and connecting each line-contact with a lamp-contact, as when the lamp is thrown in, or connecting the two line-contacts, as when the lamp is to be cut out, and the circuit along the line completed; and these bridge-plates may be designated as the "lamp-segment" and "line-segment." The lamp-segment constantly covers one lamp-contact, leaving the other one exposed for the reception of the switch-segments in use, while the line-segment constantly covers one line-contact, leaving the other exposed for use in changing the direction of the circuit. In order to effect the desired results, it is only necessary to have the relations between the contacts and segments such that in throwing in the lamp, the line-segment does not leave the exposed line contact to break the line-circuit until after the lamp-segment reaches said contact, and after said line-segment reaches the

exposed lamp-contact and thus completes the circuit through the lamp; and in cutting out the lamp, the lamp segment does not leave the exposed line-contact, nor does the line segment leave the exposed lamp-contact, and thus open the circuit through the lamp, till after the opposite end of said line-segment reaches the exposed line-contact and thus completes the line-circuit. This I accomplish by making the arcuate outer edge of one segment long enough to span three contacts at once the purpose of allowing a limited movement of both segments over the exposed line-contact upon which each must bear until the other reaches it, and upon which both must bear in the act of turning the lamp, until the line-segment reaches the exposed lamp-contact, said exposed line-contact is elongated. The segments are attached to the under side of the centrally pivoted disk of insulating material to which is likewise attached a controlling handle. Around this central disk the contracts are symmetrically arranged and the line-segment is elongated in order to make the necessary connections. The movement of the switch is limited in either direction by means of a screw which passes through a slot in the line-segment and enters that contact upon which said line-segment constantly bears.

The switch comprises in addition to the above features, certain details in the construction of the respective parts all of which will be hereinafter fully described and particularly pointed out in the claims.

In the accompanying drawings: Figure I is a perspective view of my improved switch. Fig. II is a vertical section taken on the line II—II Fig. III. Fig. III is a plan showing by full lines the position of the switch when the circuit is closed on the line and the lamp cut out. Fig. IV is a diagram showing the intermediate position of the switch in turning in or cutting out the lamp, when the line-circuit has either just been closed or is not yet opened. This figure also shows the electrical connections. Fig. V is a similar diagram showing a modification in the relative positions and arrangement of the parts. Fig. VI shows a further modification.

1, represents a block upon which my switch

is mounted and which may be formed in two parts 1^a, 1^b, of slate, glazed material or other suitable non-conductor.

2^a and 2^b, represent the respective binding-sockets in which the line-wires are secured by set-screws 3, while 4^a and 4^b are the respective sockets in which the lamp-wires are secured by set-screws 3^a. These sockets are formed in socket-pieces 5, each of which consists of a horizontal portion 6, having a socket and a vertical extension 7, at the inner end, (see Fig. II) and these socket pieces 5 are secured between the halves of the block by being countersunk therein, the vertical extensions being fitted tightly in perforations formed in the upper half of the block, and the binding screws being passed down through said upper half of the block, and threaded into the horizontal portion of the socket-piece and entering the socket. The halves of the block are secured together in any suitable manner, as for instance, by a number of screws 8, inserted at convenient points in both sides, or by any other suitable means. The socket-pieces are inserted as described, so that the upper ends of their vertical extensions protrude slightly above the surface of the upper half at points symmetrically arranged around the center of the block so as to form contacts 10, 11, 12 and 13.

14, represents the pivot of the switch which may consist of a screw passed down through the upper half and met by a jam-screw 15, passed up through the lower half of the block. Upon this pivot is mounted the supporting disk 16 of insulating material, beneath which is inserted a spacing washer 17. Upon this disk are supported the segmental line bridge-plate 18 and the segmental-lamp bridge-plate 19 or line-segment and lamp-segment which may be attached in any suitable manner, as to the under side by means of screws 20, and the former of which is elongated to make the necessary connection with the symmetrically arranged contacts. The shorter plate 19 is of ample length to readily span the distance between contacts 11 and 12 and slightly more, in order to give it a limited movement upon the elongated contact 11. The elongated line-segment 18 bears constantly upon the contact 10 and is of sufficient length to span the distance between said contact 10 and the contacts 11 and 13 at the same time, the segments 18 and 19 being attached at such points to the disk 16, that the end 18^a of the line-segment 18 will reach the elongated contact 11 before the end 19^a on the lamp-segment 19 leaves said contact, and also before the end 18^b of line-segment 18 leaves the contact 13. Such construction necessarily results in the movement of the end 19^a upon contact 11, when the lamp is thrown into circuit before end 18^a leaves said contact and after the end 18^b reaches the contact 13. In order to limit the movement of the switch in opposite directions, one of the segments is provided with a slot 18^c, and a screw 22 which

has interposed washer 23 and passes down through the slot 18^c and that contact with which the segment constantly connects, I have shown the slot in line-segment 18 and the screw passing into contact 10. The slot 18^c is of such length as to permit the movement of the switch the proper distance in either direction.

24 represents a controlling handle secured, as by means of screws 25, to a convenient point on the disk 16. I have shown the segments and contacts in such relation that the lamp-segment does not reach both lamp-contacts when the lamp is cut out, and it is obviously unnecessary that it should. In order that the line-segment may reach the exposed lamp-contact when the contacts are symmetrically arranged, said segment is elongated circumferentially, but this is not essential to the operation for the reason that, the said lamp-contact could be shifted so as to be within reach of a line-segment of equal length with the lamp-segment, as shown in Fig. IV, and I therefore do not limit myself to an elongated line-segment, since my invention consists in so constructing and arranging the parts that by the same movement, the lamp-segment connects one lamp-contact and one line-contact while the line-segment connects the other two contacts, so that one end of the line-segment leaves one line-contact only after the lamp-segment reaches the same and its other end has reached the exposed lamp-contact, and vice versa. When cut out the lamp has no connection with the line whatever so that the danger in repairing a lamp is entirely removed.

In Fig. VI I have shown a modified form in which the lamp is constantly connected with one end of the line wire, while a single segmental plate 25 is elongated to close the break between the lamp and the other line-wire for throwing in the lamp and maintain connection between the two line contacts until this is accomplished, or to open said break between the lamp and line-contact for throwing out the lamp, after completing the circuit along the line. This modification while embracing the features of my invention, has a disadvantage in that the lamp is never wholly disconnected from the line and a ground circuit through the line-man is liable to be made with dangerous results.

While the bridge-plates may be of any suitable or convenient shape, I have shown them formed in segments with their outer portions in arcs concentric with the switch pivot. The handle preferably extends as shown between the two segments so as to avoid danger of contact with the segments.

From the foregoing description it will be seen that a lamp, such for instance, as an arc lamp may be thrown in and out of series-connection without ever opening the circuit and consequently without sparking.

I have made no special mention of well-known features of electric switches which are usually resorted to for the purpose of insuring

perfect contact between the parts, because the desirability of these features will be obvious and they may be added by those skilled in the art without altering the character or principles of my invention. Generally speaking, parts should be thoroughly insulated and have good broad rubbing surfaces for contact, and means for taking up the wear in order to prevent any slight separation of the contact-surfaces which would result in arcing and consequently destructive sparking. The central screw will usually be found to afford ample adjustment.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In an electric switch the combination of the base; the line-contacts and lamp-contacts thereon; the line-segment and lamp-segment having arcuate rims substantially as described and the means for limiting the movement of the switch consisting of the arcuate slot in the rim of the line-segment and a screw passed through said slot and into a line-contact as explained.

2. The combination of the base divided into two parts; the socket-pieces mounted in said

base and consisting each of a horizontal portion, countersunk in the respective parts of the base and the vertical extension projecting through the upper part of the base and forming an exposed contact; and the segmental bridge-plates mounted pivotally upon the base for use in connection with the contacts substantially as and for the purpose set forth.

3. In an electric switch, the combination of the base formed in halves the socket-pieces inserted between them and having the sockets and contacts for the respective terminals of the line and lamp-wires, the binding screws passed through the upper half of the block and threaded into the socket pieces, the insulating disk pivotally mounted centrally to said contacts, the segmental plates secured to the periphery of said disk and adapted to bridge the space between the contacts, and the lever or handle likewise connected with said insulating disk substantially in the manner and for the purpose set forth.

GEORGE WASHINGTON WEBB.

Witnesses:

WALTER GASTON,
JOHN C. BRIDGBACH.