

No. 762,675.

PATENTED JUNE 14, 1904.

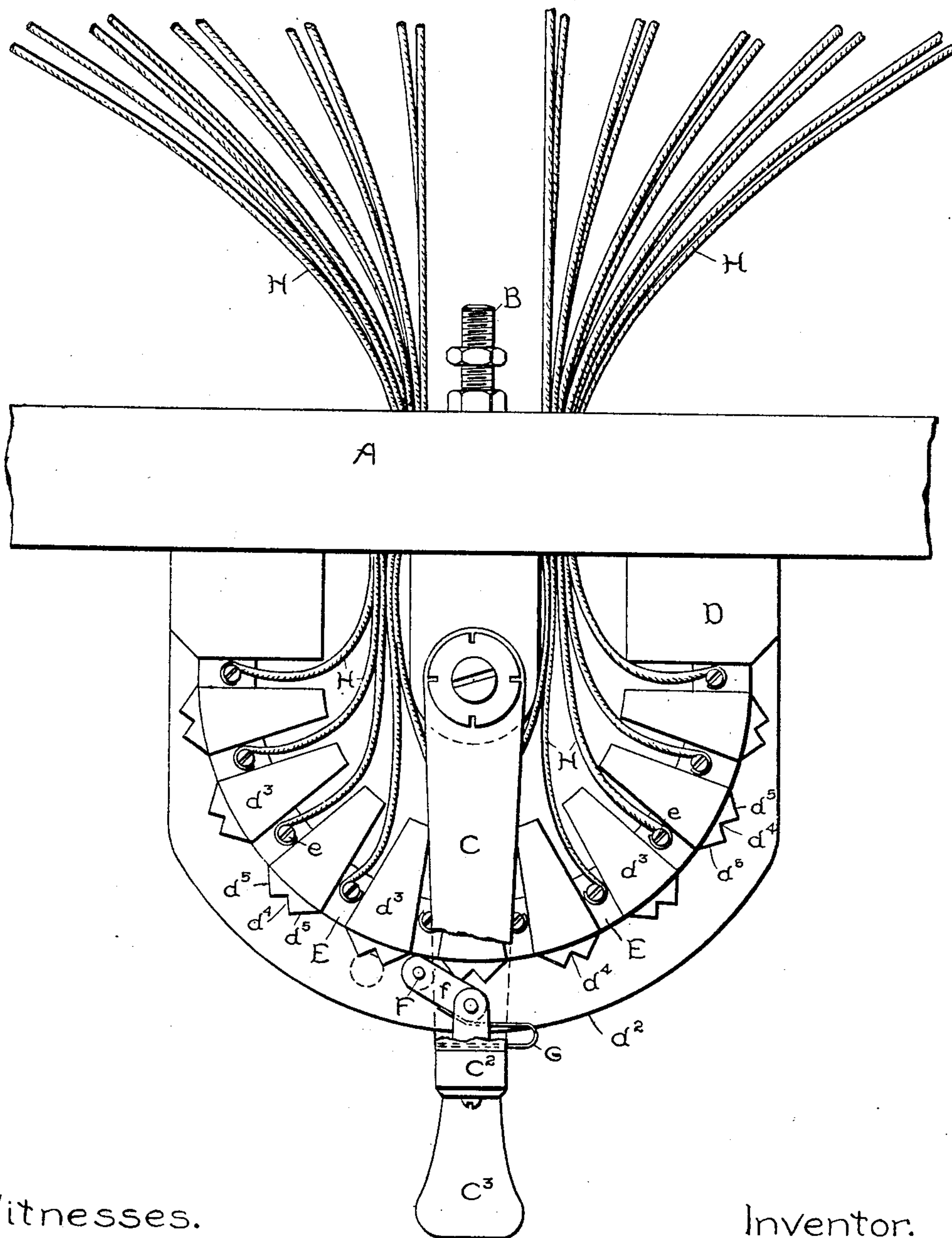
C. C. BADEAU.  
MULTIPLE POLE VOLTMETER SWITCH.

APPLICATION FILED JULY 27, 1901.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

*Erving R. Gurney.*

*Benjamin B. Hume.*

Inventor.

Charles C. Badeau.

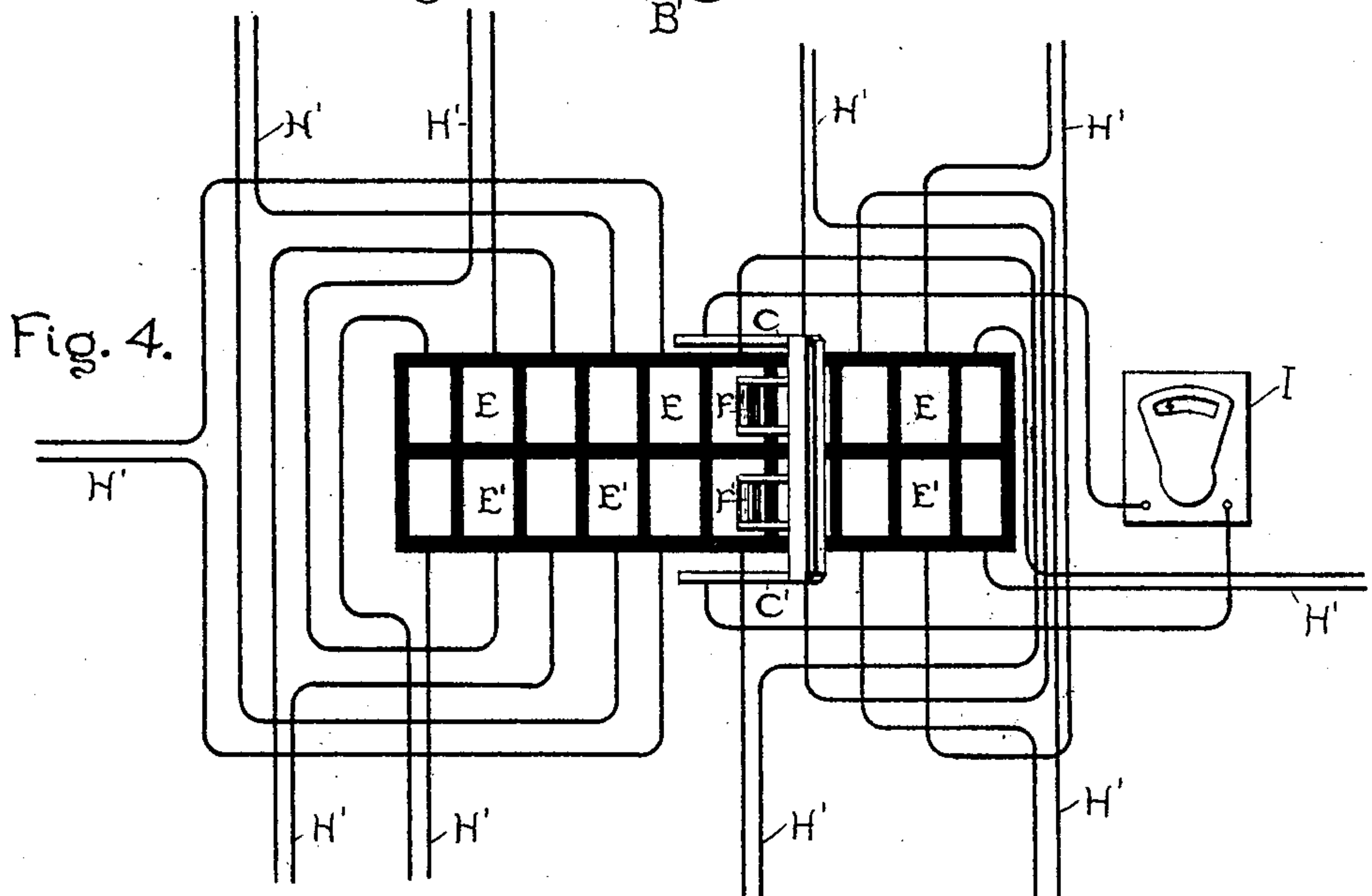
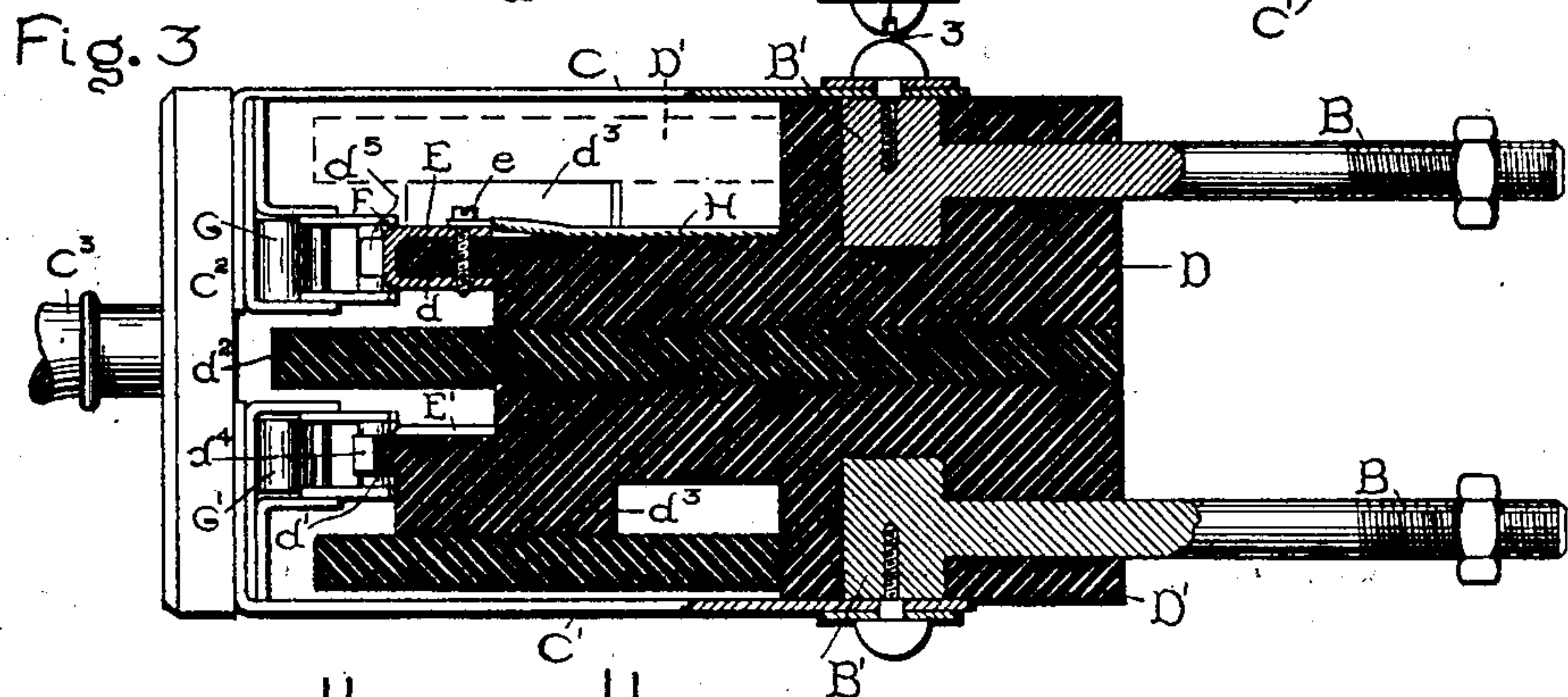
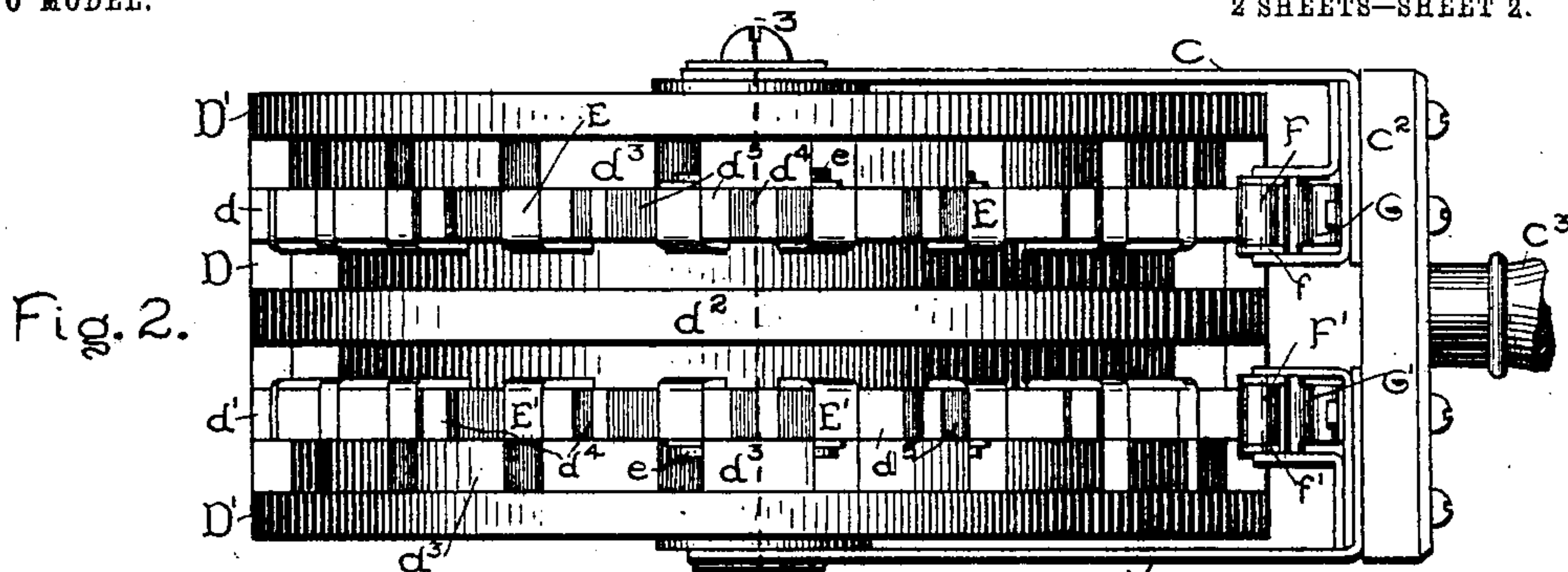
by *Albert B. Davis*  
Atty.

C. C. BADEAU.  
MULTIPLE POLE VOLTMETER SWITCH.

APPLICATION FILED JULY 27, 1901.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses.

Inventor.

*Erving R. Gurney.*  
*Benjamin B. Hure.*

*Charles C. Badeau.*  
by *Albert E. Davis*  
Atty.



# UNITED STATES PATENT OFFICE.

CHARLES C. BADEAU, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## MULTIPLE-POLE VOLTMETER-SWITCH.

SPECIFICATION forming part of Letters Patent No. 762,675, dated June 14, 1904.

Application filed July 27, 1901. Serial No. 69,970. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES C. BADEAU, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Multiple-Pole Voltmeter-Switches, of which the following is a specification.

This invention relates to electric switches; and its object is to provide means for quickly connecting a voltmeter across any pair of a plurality of pairs of wires feeding electric circuits in order to determine at any given moment the voltage on said pair. It can also be used to compare the voltages on the several pairs, since readings can be taken very quickly in succession from all the pairs of feeders.

The invention consists in a multiple-pole switch having a plurality of pairs of stationary contact-segments, a movable arm or arms carrying a single pair of contacts adapted to bridge each pair of stationary segments in succession, and terminals connected with the contacts on the arm or arms and adapted to be connected with a voltmeter. Between every two stationary segments is interposed a shield of insulation with means for detachably holding the movable contact as it passes from one segment to the next. The moving contacts are preferably so formed that when resting on the shield they do not come in contact with it at all points in order to prevent the shield from acquiring a coating of metal rubbed off from the moving contact.

In the accompanying drawings, Figure 1 is a top plan view of my improved multiple-pole switch. Fig. 2 is an edge view. Fig. 3 is a cross-section on the line 3 3, Fig. 2; and Fig. 4 is a diagram of circuits.

The switch is supported by the switch-board A, being fastened to it by two bolts B, which serve also to connect the terminals of the voltmeter to the moving contacts of the switch. Each bolt is in electrical connection with a pivoted metallic arm C C', preferably pivoted to the head B' of the bolt, which is embedded in a block of insulation D. The arms are pivoted on the same axis and on op-

posite sides of the block, and their outer ends are mechanically connected by a bar of insulating material C<sup>2</sup>, on which is a handle C<sup>3</sup>. The edge of the block D is semicircular concentric with the pivots of the arms. It carries two parallel sets of contact-segments, consisting, preferably, of U-shaped metal clips E E', fitting tightly on the periphery of flanges d d', lying in parallel planes. Between these two flanges is a guard-flange d<sup>2</sup>, projecting out, preferably, beyond the segments E E'. On the flanges d d' and between every two segments is a shield d<sup>3</sup>, of insulating material, preferably integral with the block D. The shield projects not only beyond the face of the flange, but also beyond its periphery, so that each segment is housed in a groove extending along the face and across the edge of the flange. The peripheral portion of the shield has a central V-shaped notch d<sup>4</sup>, on each side of which it slopes down to the adjoining segment by inclined surfaces d<sup>5</sup>. A plate D', of insulation, is placed above and below the flanged portions of the block D. This plate is removed in Fig. 1 and is shown in dotted lines in Fig. 3.

The arms C C' each carry at the outer end a roller-contact F F', preferably spring-mounted, so that it will ride up over the shields as it is moved from segment to segment. I prefer to journal the roller in the ends of links f f', hinged to the arms and pressed inward by a flat spring G G'.

To each segment is connected one terminal of a lead H from a feeder-wire H', the leads from any given pair of feeders being connected with corresponding segments in the two sets. The connection is easily made by clamping the end of the lead under the head of the screw e which fastens the segment to the flange.

A voltmeter I is permanently connected with the bolts B. When a reading is to be taken, the observer moves the arms C C' over the block until the rollers rest on the proper pair of segments, as shown in Figs. 1, 3, and 4, which places the corresponding leads in circuit with the voltmeter. (See Fig. 4.) When no reading is desired, the rollers are moved



into one of the notches  $d^t$ , by which they are securely held out of contact with any segments, as shown in dotted lines in Fig. 1.

The surface of the shields is liable to become coated with particles of metal rubbed off the rollers in their passage to and fro over them, and to prevent the formation of a continuous metallic film, which might assist in drawing an arc over from one segment to the next, the roller is large enough in diameter to prevent it from entering very far into the notch  $d^t$ , as shown in Fig. 1, so that a considerable portion of the notch is free from any metal particles.

This multiple-pole switch forms a neat and convenient device for quickly taking readings across any pair of a plurality of pairs of feeder-conductors. It occupies but little space on the switchboard and requires the boring of only six holes, one for each bolt B and one for each of the four groups of five feeders, two on each side of the block and two on each side of the pivots.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A multiple-pole switch consisting of a block of insulation having semicircular flanges, contact-segments on said flanges, shields of insulation between said segments, feeders connected with the several pairs of segments, movable contacts pivoted at the center of said flanges and adapted to bridge the several pairs of segments in order, and a voltmeter in circuit with the movable contacts.

2. A multiple-pole switch, consisting of a block of insulation having semicircular flanges, contact-segments on said flanges, a shield of insulation between every two seg-

ments, said shield having upwardly-inclined edges, and contact-arms cooperating with said segments and shields.

3. A multiple-pole switch, consisting of a block of insulation having semicircular flanges, contact-segments on said flanges, a shield of insulation between every two segments, said shield having inclined edges and a notch in its top, and contact-arms cooperating with said segments and shields.

4. In a multiple-pole switch, the combination with contact-segments, of a shield of insulation between every two segments, having a V-shaped notch in its top, and a contact-arm carrying a roller adapted to make contact with the segments and rest in the notches.

5. A multiple-pole switch, consisting of a block of insulation having two semicircular flanges lying in parallel planes and carrying contact-segments, a guard-flange between them, bolts having heads embedded in said block, and contact-arms pivoted to said bolts on each side of said block.

6. A multiple-pole switch, consisting of a block of insulation having two semicircular flanges, U-shaped contact-segments on the periphery of said flanges, insulating-shields between the segments, a guard-flange between the aforesaid flanges, and arms carrying spring-mounted contacts and pivoted at the center of said flanges.

In witness whereof I have hereunto set my hand this 25th day of July, 1901.

CHARLES C. BADEAU.

Witnesses:

BENJAMIN B. HULL,  
CHARLES STEINER.