

No. 751,654.

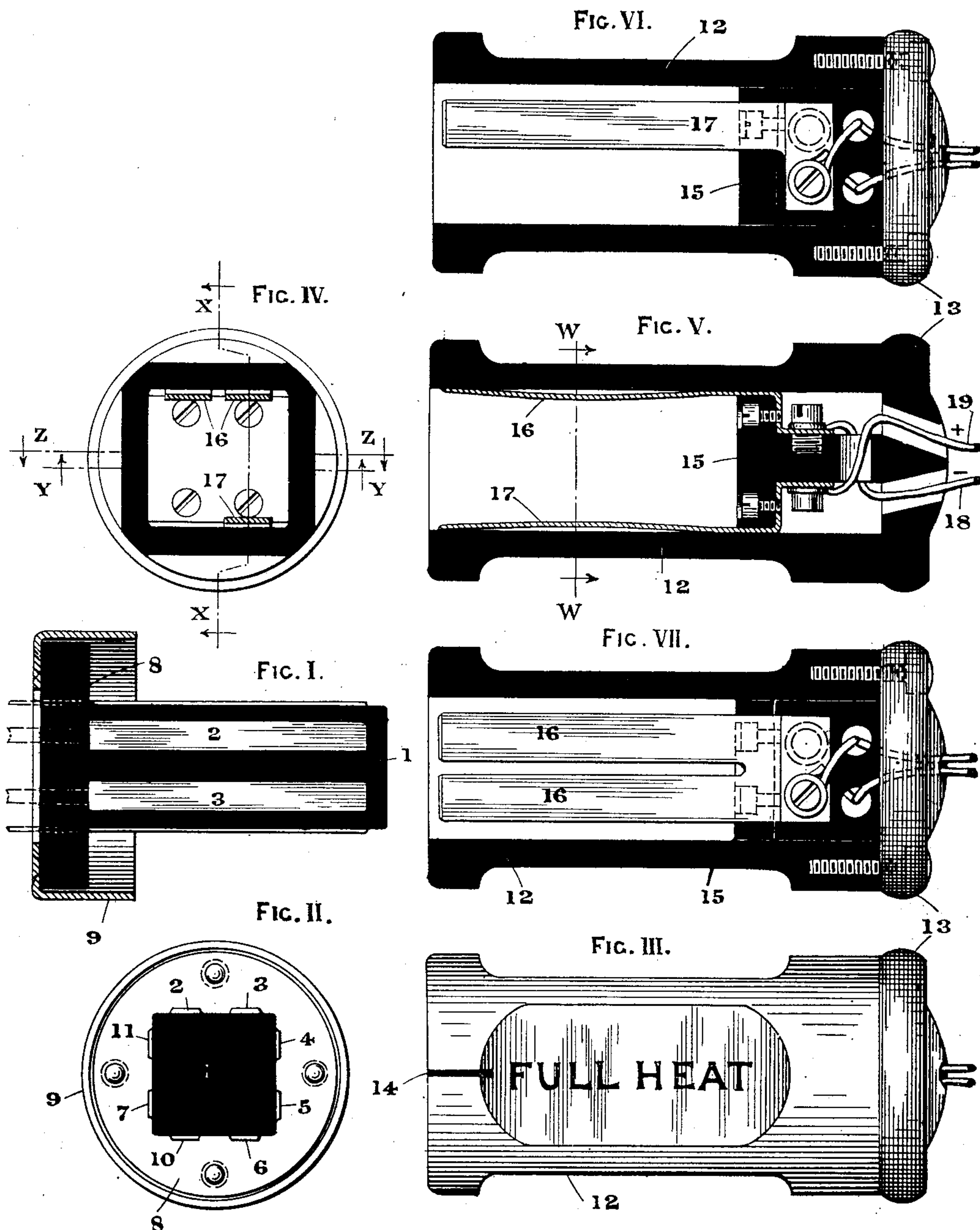
PATENTED FEB. 9, 1904.

W. D. KILROY.
APPARATUS FOR THE REGULATION OF ELECTRICAL CIRCUITS IN
HEATING DEVICES.

NO MODEL.

APPLICATION FILED OCT. 6, 1902.

2 SHEETS—SHEET 1.



Attest:

Edw. L. Reed

*Inventor,
Willie D. Kilroy*

*by Wm. Spear
atty.*

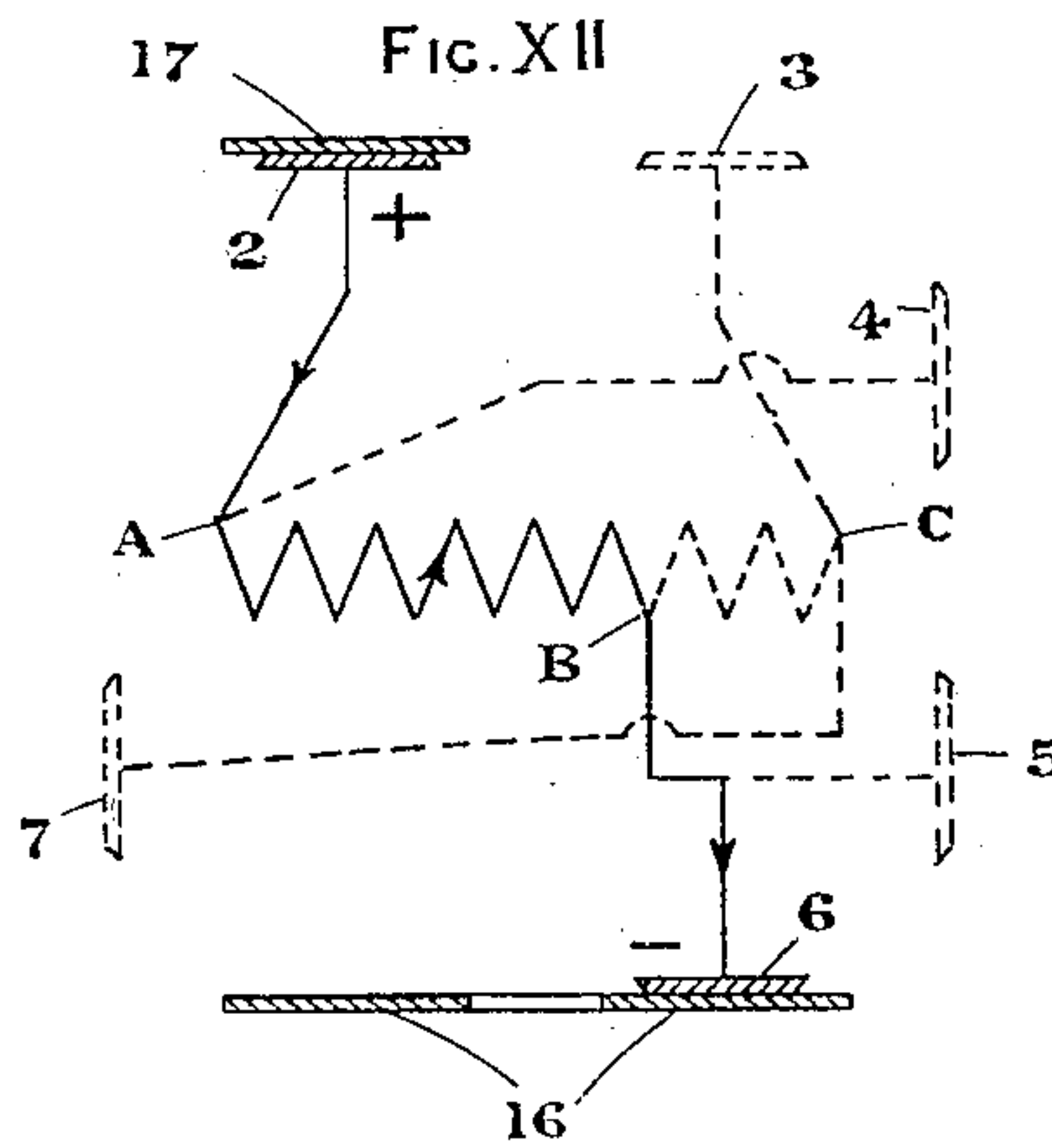
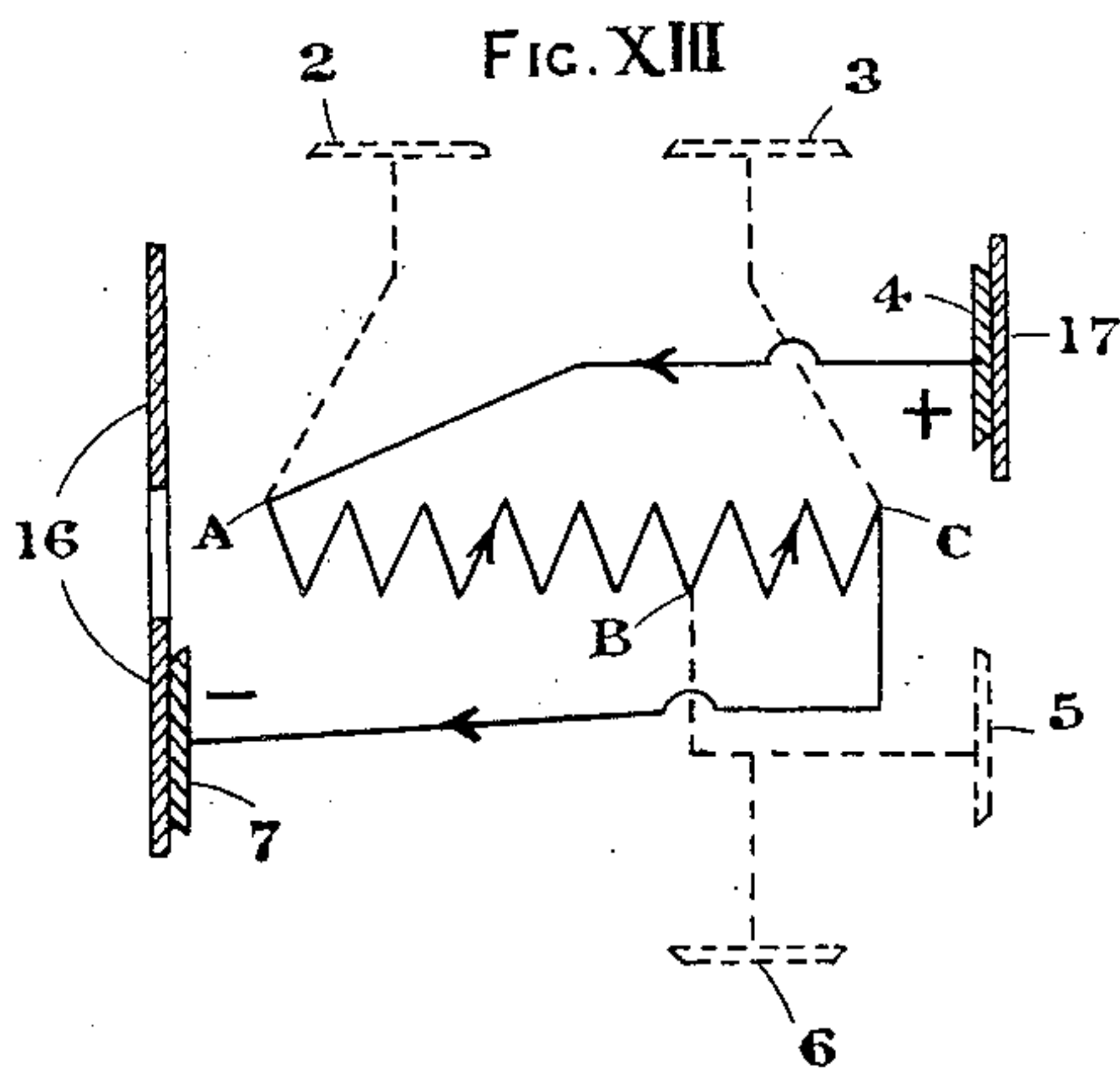
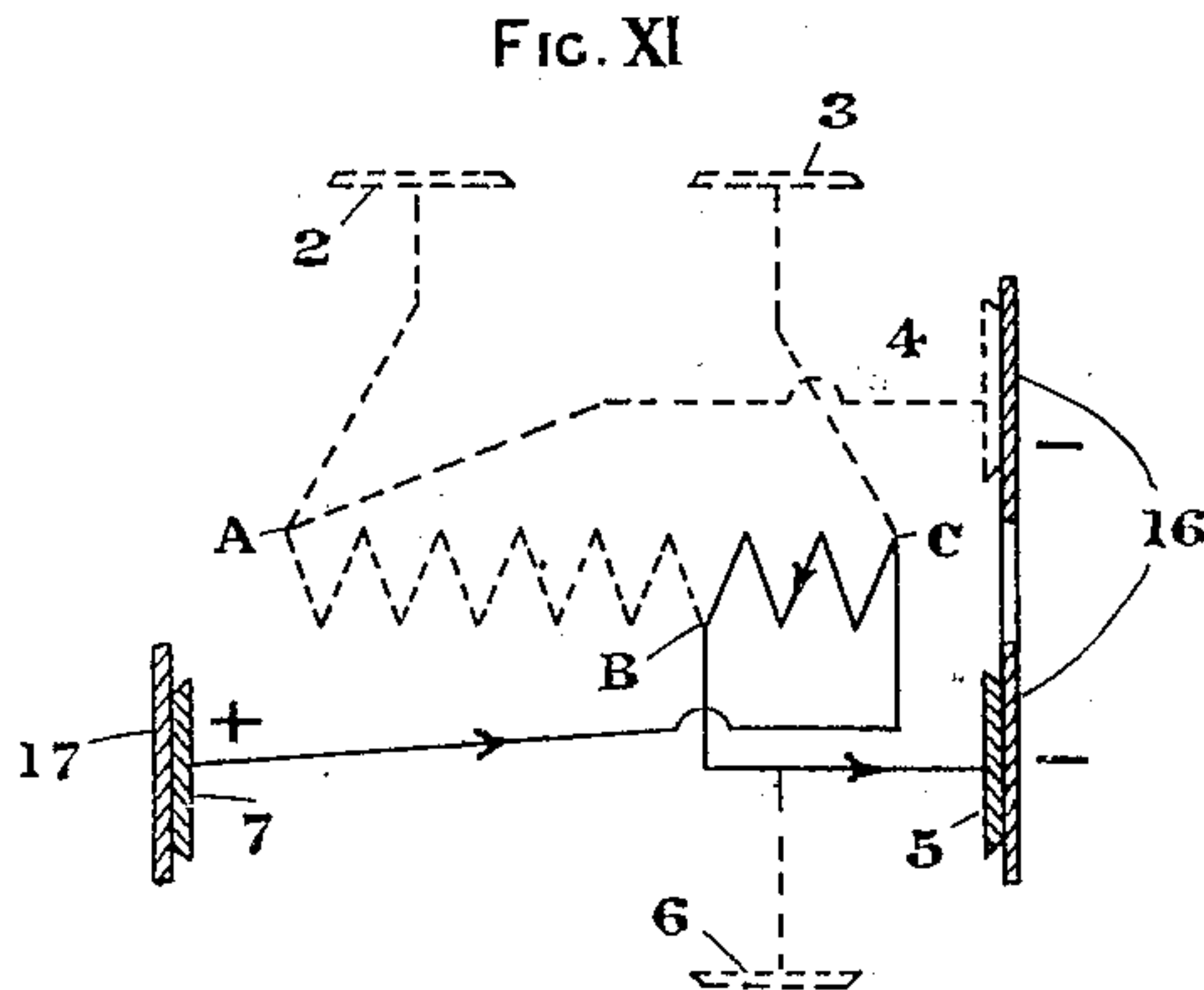
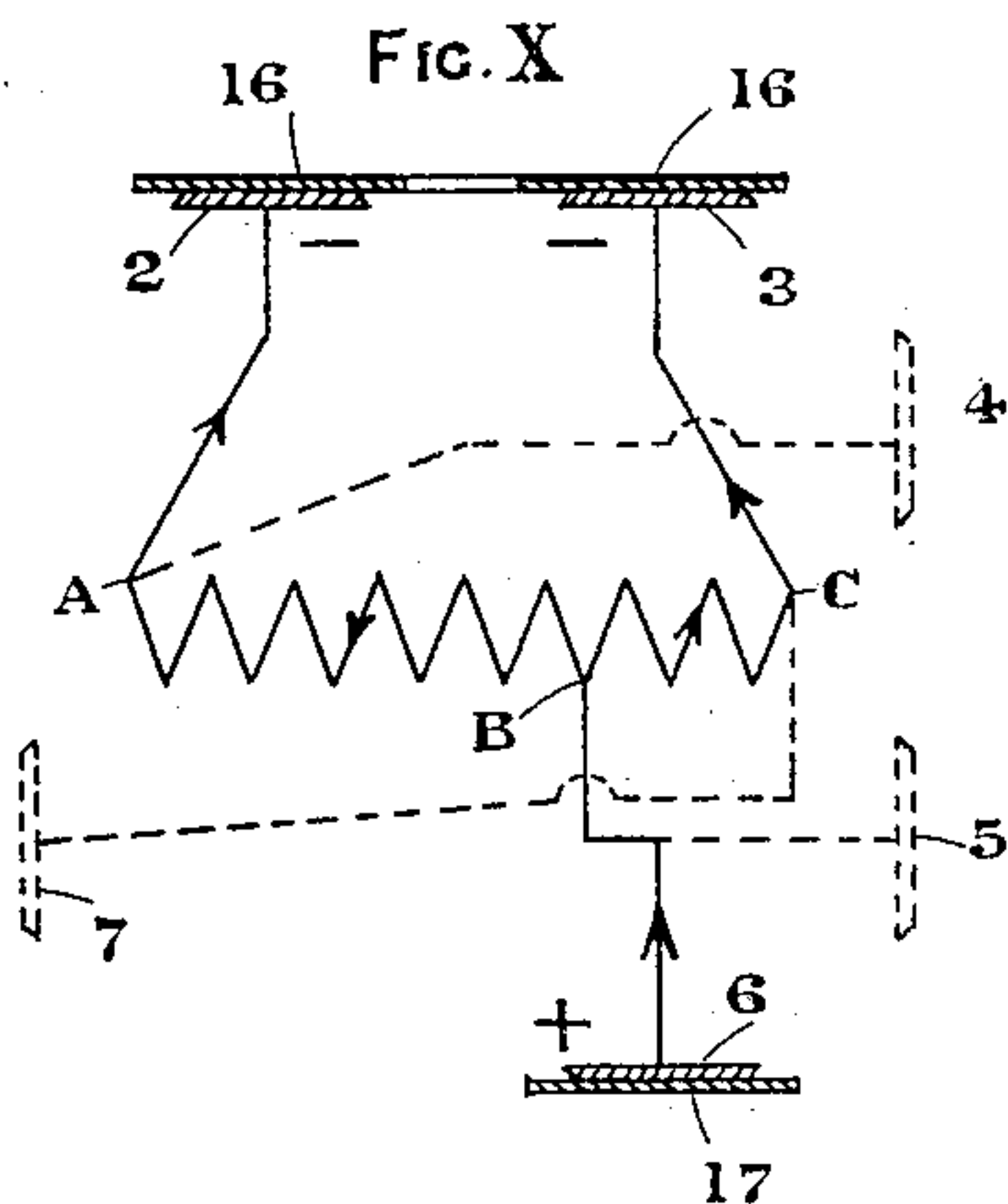
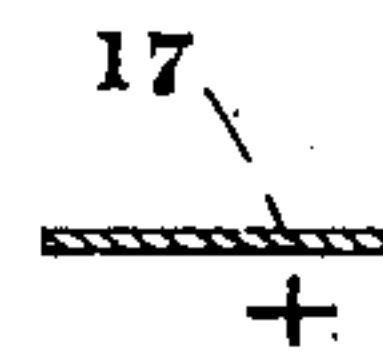
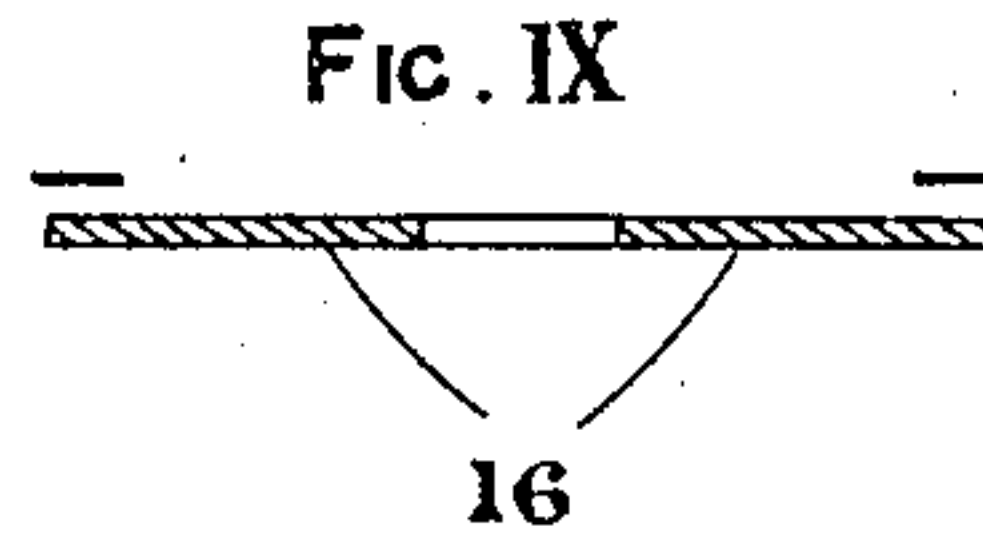
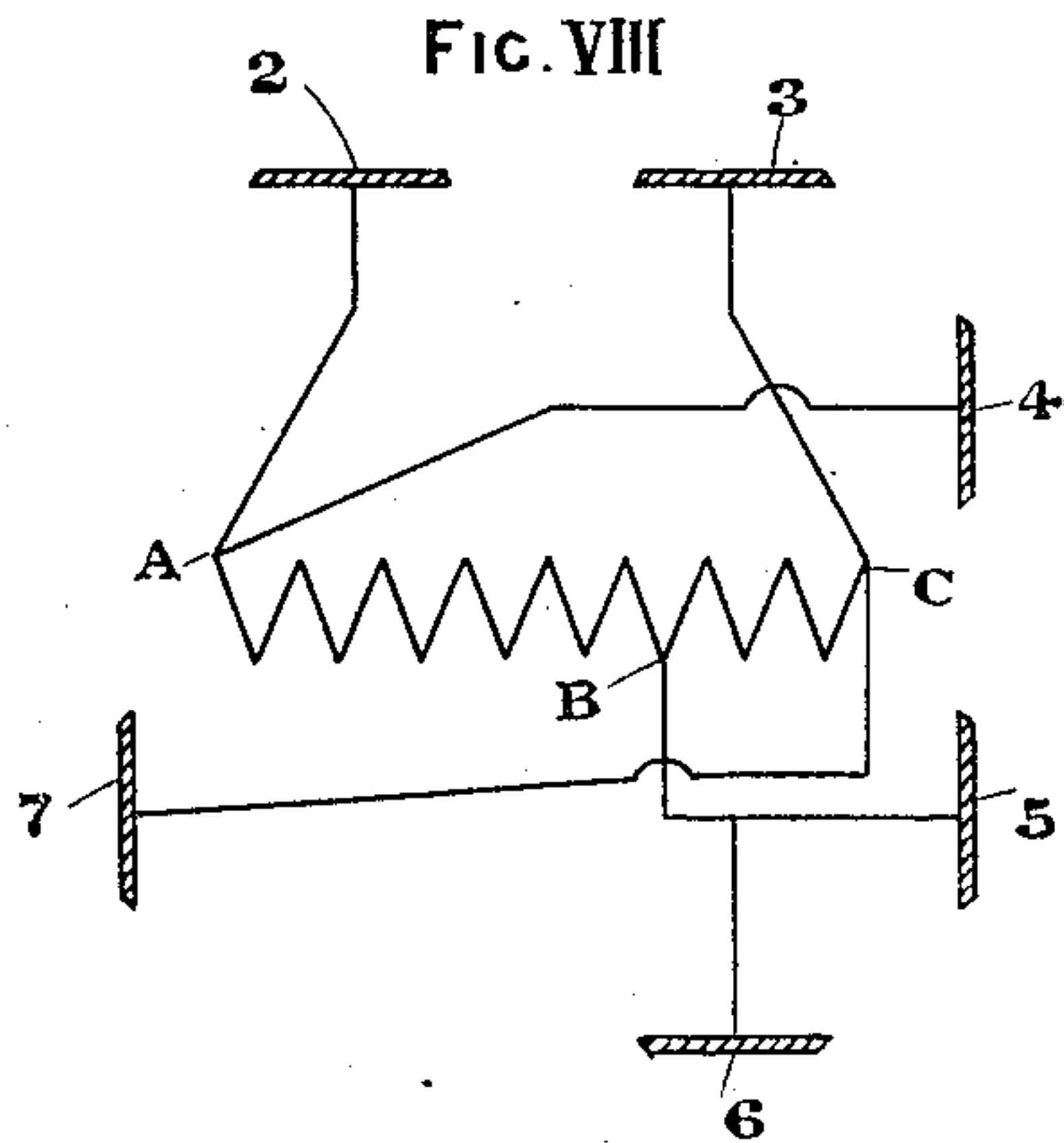
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2 SHEETS—SHEET 2.



Attest:
 Comm. L. Reed

Inventor
 Willie D. Kilroy.
 by E. H. Bear atty.

UNITED STATES PATENT OFFICE.

WILLIE DICKSON KILROY, OF UXBRIDGE, ENGLAND.

APPARATUS FOR THE REGULATION OF ELECTRICAL CIRCUITS IN HEATING DEVICES.

SPECIFICATION forming part of Letters Patent No. 751,654, dated February 9, 1904.

Application filed October 6, 1902. Serial No. 126,224. (No model.)

To all whom it may concern:

Be it known that I, WILLIE DICKSON KILROY, a subject of the King of Great Britain, residing in Uxbridge, in the county of Middlesex, England, have invented certain new and useful Improvements in Apparatus for the Regulation of Electrical Circuits in Heating Devices, of which the following is a specification.

10 This invention relates to improved apparatus for regulating the connection to supply-terminals of electrical circuits and resistances in various ways in electrical heating devices—such as kettles, cooking appliances, and the
15 like; and it consists of a combined plug and socket operating as a switch in various angular positions for closing electrical circuits in any desired manner, the effect of such various angular positions and connections being indicated visibly to an inexperienced user.

It is the practice in electrically-heated devices to provide a subdivided resistance so connected that various degrees of heating effect can be produced. These various connections are sometimes regulated by separate
25 plugs and sockets, usually three plugs and three sockets, which are adapted to be combined in various ways to give the desired various connections. It is obvious that the various dispositions of such sockets and plugs
30 may lead to confusion in the case of an inexperienced user, due to want of knowledge or failure to recollect the particular arrangement of plugs and sockets to produce the desired effect.

35 My invention unites all the various contacts for any desired arrangement of circuits in one plug and socket, such plug and socket being prismatic as to external shape—such as a square, hexagon, and the like—so that each desired angular position of the plug in the socket
40 is definite, and the relative effect of each respective angular position of the plug to the socket may be visibly indicated in a clear and unmistakable manner, so that an inexperienced user
45 cannot make the connections otherwise than for producing some definite heating effect and can have no difficulty in producing the effect desired.

A convenient form of my apparatus is that
50 of a fixed plug attached to the heating appli-

ance, such plug having insulated contacts upon its various rectilinear faces, such contacts being connected to three or more desired points of a subdivided resistance adapted for heating the heating device. With three conductors
55 connected one to each extremity of a resistance and the third to a point between such ends, dividing the resistance into unequal parts, four degrees of heating effect can be produced, which is probably as considerable a range as
60 may be generally required, and this would necessitate a plug and socket with four sides, giving the respective four angular positions to close up the circuit in the four required methods. I have accordingly illustrated a four-
65 sided plug-and-socket arrangement in the accompanying drawings, in which—

Figure I is a side elevation, and Fig. II is an end elevation, of the plug. Figs. III to VII refer to the socket, Fig. III being a plan,
70 Fig. IV a transverse section on the line W W of Fig. V, and Figs. V, VI, and VII longitudinal sections on the respective lines X X, Y Y, and Z Z of Fig. IV. Figs. VIII to XIII are diagrammatic views to explain the various
75 ways of connecting to the resistance. Fig. VIII shows the resistance and the strips on the plug permanently connected to it. Fig. IX shows the strips of the socket, and the remaining four figures show the effect of placing the
80 socket on the plug in its four different positions.

Throughout the drawings the same parts are indicated by the same reference characters.

1 is the plug, formed of any suitable non-
85 conducting material, as ambroin or woodite, and 2, 3, 4, 5, 6, and 7 are insulated conducting contact-strips, usually of copper, molded into or otherwise fixed to the plug. These contact-strips pass through the enlarged end
90 8 of the plug and are electrically connected permanently to the resistance in accordance with the scheme represented diagrammatically in Fig. VIII—that is to say, AC being the resistance the contact-strips 2 and 4 are con-
95 nected to one end, A, the strips 3 and 7 to the opposite end, C, and the remaining strips 5 and 6 to an intermediate point B, such that the resistance of BC is less than that of AB.

In the case of an electrically-heated cook- 100

ing appliance, for which the invention is especially applicable, it will be understood that the plug 1 is fixed thereto and that the resistance and the permanent connections thereto are incorporated with the cooking appliance in such a way as to be protected from any accidental contact or injury.

9 is a shield, of spun metal or the like, fixed to the end of the plug and covering the joint between it and the end of the socket. Its object is to throw off any liquid which may be accidentally spilled and to prevent its entry into the said joint. It will be noted by reference to Fig. II that in addition to the contact-strips already referred to there are two additional ones 10 and 11. These latter are electrically "dead" and are only fitted to make the socket fit better mechanically on the plug, and they are therefore omitted in Figs. VIII to XIII.

Referring now to Figs. III to VII, the socket 12 is made of non-conducting material, with a square prismoidal cavity adapted to pass freely over the plug in any of the four positions. It is closed at one end by the cap 13, and its four external faces are legibly marked to indicate the effect of placing any particular one of the four index-lines 14 opposite a fixed mark on the shield 9. The inscriptions may, for instance, be "Full heat," "Three-quarter heat," "Half heat," and "Quarter heat," although the gradations of heating effect produced may not necessarily be in these exact ratios.

The non-conducting cap 13 has a projecting stem 15, to which the insulated conducting contact-strips 16 and 17 are attached by the screws shown. The strip 16 is wide and bifurcated and connected to, say, the negative supply-lead 18. The strip 17, which is single, is connected to the positive lead 19. The leads are taken tortuously through the holes, as shown, so as to make the connections more secure from mechanical injury. The strips are elastic and bowed slightly, so as to facilitate their intimate contact with the corresponding strips of the plug.

Referring now to Figs. VIII to XIII, Fig. VIII shows, as already stated, the scheme of the connections of the plug-strips to the resistance, and Fig. IX shows the relative positions of the strips of the socket.

In the remaining figures the effects are shown of placing the socket on the plug in each of its four positions. In each case the circuit taken by the current is shown in full lines, the dead portions being indicated by dotted lines.

In Fig. X, which corresponds with the greatest heating effect, the current flows in parallel through the two sections BA and BC of the resistance, and the resistance is at a minimum. When the socket is turned through a quarter-turn, as in Fig. XI, the current flows through the shorter section CB of the resistance. A further quarter-turn, as in Fig. XII, causes

the current to flow through the longer section AB of the resistance, while a further quarter-turn, as in Fig. XIII, throws the whole resistance AC into the circuit. It will be noted that the resistances offered to the current in the socket positions corresponding to Figs. X, XI, XII, and XIII, respectively, are in ascending ratio and the heating effects therefore in descending ratio, and by properly selecting the point B the respective heating effects can be graded, so as to agree approximately with the inscriptions on the four faces of the socket.

The arrangement shown provides for four gradations of heating effect, which generally suffice for ordinary requirements; but various other arrangements of subdivided resistance may be arranged with multiple sides to the plug and socket to give further gradations of heating effect in a similar manner.

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

1. In apparatus as herein described, in combination, a prismatic plug having contact-strips on the several faces; a subdivided electrical conductor, to the terminals and point of subdivision of which the said plug contact-strips are severally connected; and a prismatic socket adapted to fit on the said plug in the several angular positions and having contact-strips on the internal faces connected to supply-terminals and adapted to make contact with various groups of the contact-strips on the plug, according to the relative angular positions of the plug and the socket; substantially as described and illustrated.

2. In apparatus as herein described, in combination, a prismatic plug having contact-strips on each of its faces; a prismatic socket adapted to fit on the said plug in the several angular positions, and having contact-strips on two opposite faces adapted to make contact with various groups of the plug contact-strips, according to its angular position thereon; and electrical connections from the plug contact-strips to the circuits to be controlled and from the socket contact-strips to the supply-terminals; substantially as described and illustrated.

3. In apparatus as herein described, in combination, a square prismatic plug having pairs of contact-strips on each of its four faces, six of which strips are connected to the terminals and point of subdivision of an electrical conductor; a square prismatic socket adapted to fit the plug in the four angular positions and having contact-strips on opposite faces connected to supply-terminals and adapted to make contact with a different particular group of the plug contact-strips for each of its four angular positions thereon; substantially as described and illustrated.

4. In combination, the prismatic plug; the plug contact-strips; the subdivided conductor

connected thereto; and a prismatic socket having elastic strips connected to the supply-mains and carried from the end cap of the socket; substantially as described and illustrated.

5 5. In combination; the prismatic socket with contact-strips connected to the supply-mains, and the prismatic plug with contact-strips connected to the subdivided electrical
10 conductor and having a shield carried from the end thereof and adapted to house the end of the socket when the latter is in position; substantially as described and illustrated.

15 6. In combination, the square prismatic plug, having contact-strips thereon connected to the subdivided conductor, and provided with a shield to house the end of the socket, and the square prismatic socket having elastic contact-pieces connected to supply-termi-
20 nals and having labels on its four faces to indicate its angular position, with reference to the plug, to give the effect indicated by the labels; substantially as described and illustrated.

25 7. In combination, the square prismatic

plug having a pair of contact-strips on each face, the four pairs being connected respectively: to the two terminals of a subdivided resistance, to the point of subdivision and one terminal, and one strip of each of the remain- 30
ing pairs being connected respectively to one terminal and to the point of subdivision only; and the square prismatic socket having a double contact-strip on the one face connected to one supply-terminal and a single contact-strip 35
on the opposite face connected to the other supply-terminal, the socket being adapted to fit the plug in the four angular positions and the socket-strips being elastically supported in the socket so as to make contact with the 40
plug-strips; substantially as described and illustrated.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIE DICKSON KILROY.

Witnesses:

E. B. VIGNOLES,

O. SCHEIDER.