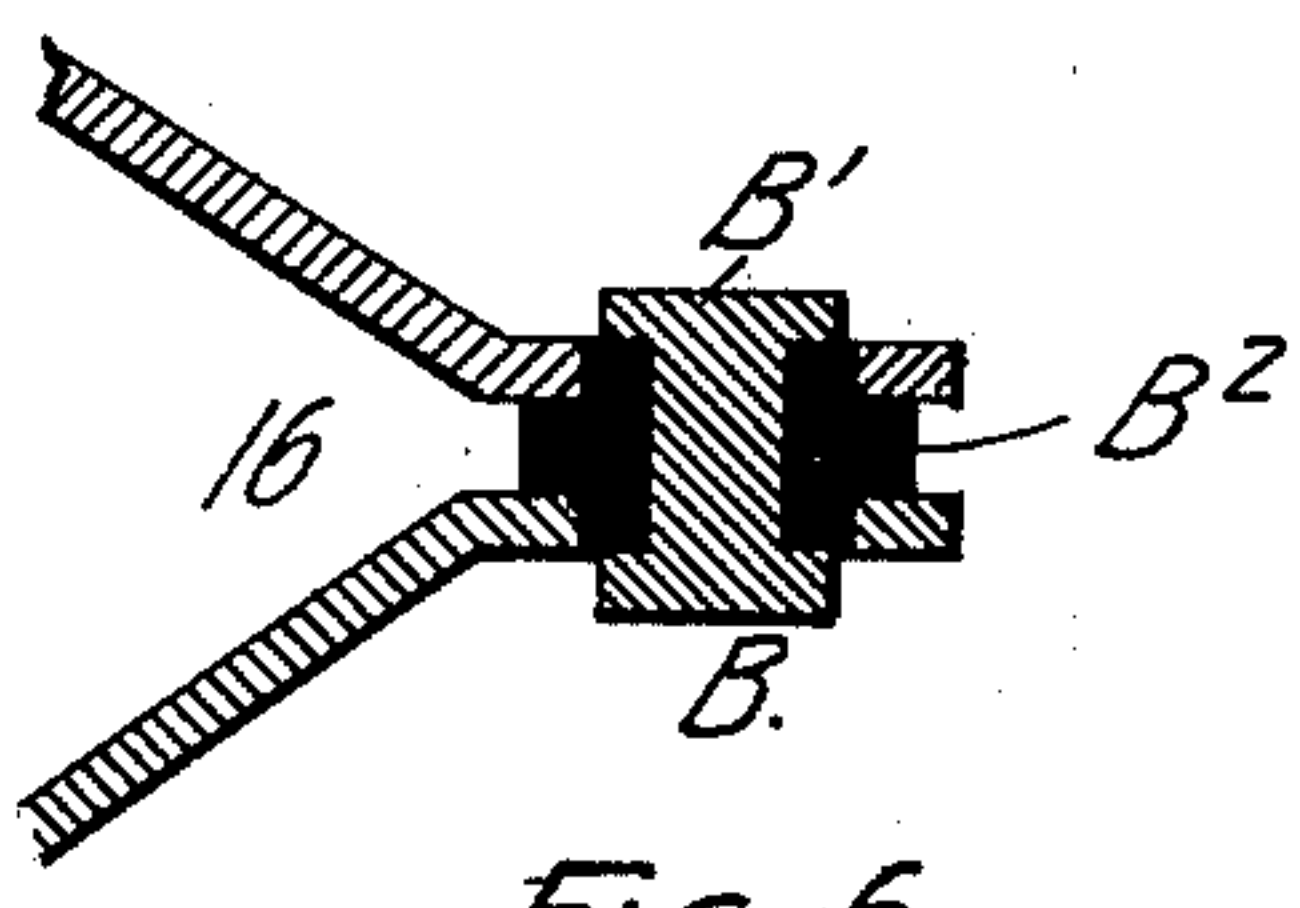
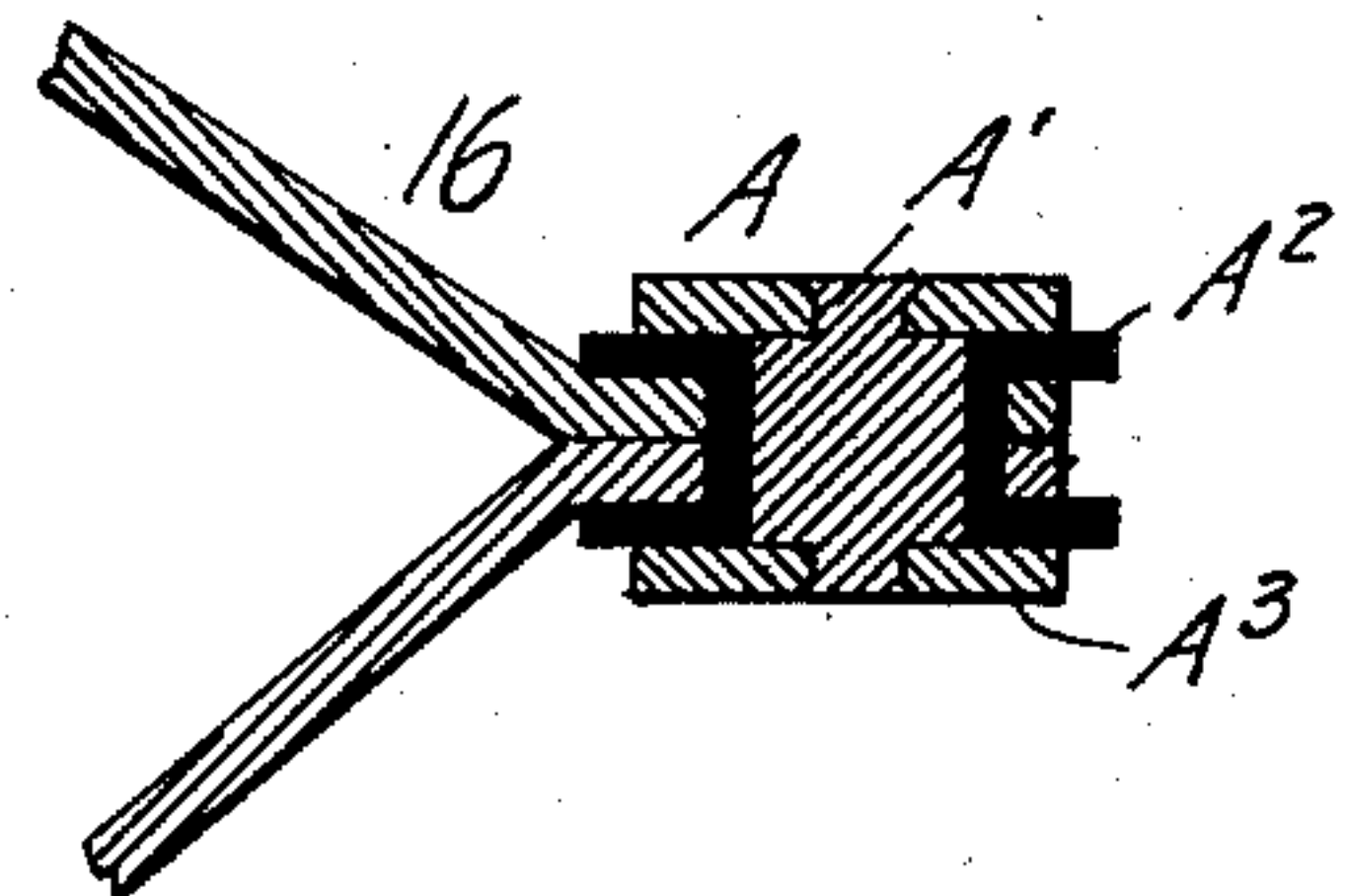
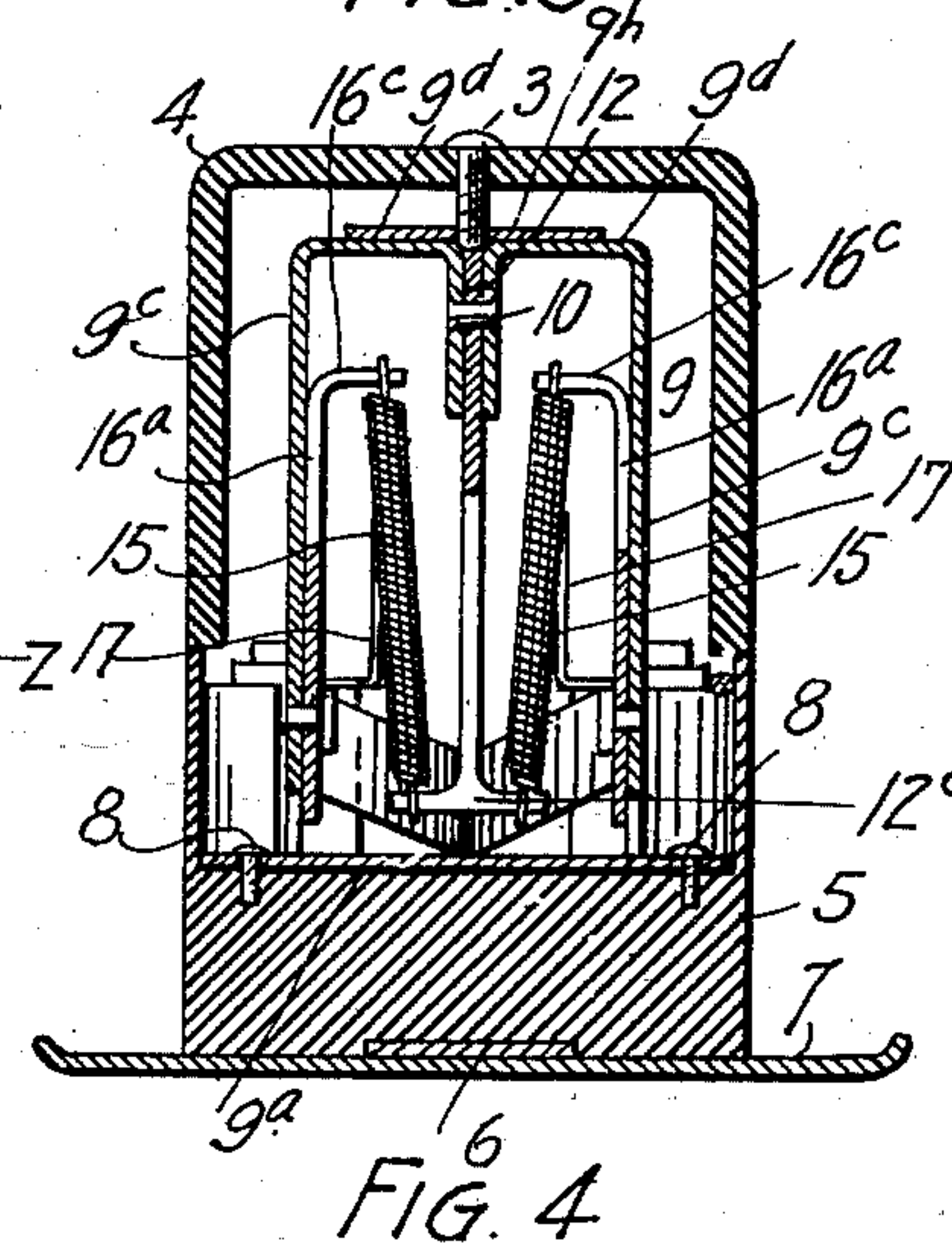
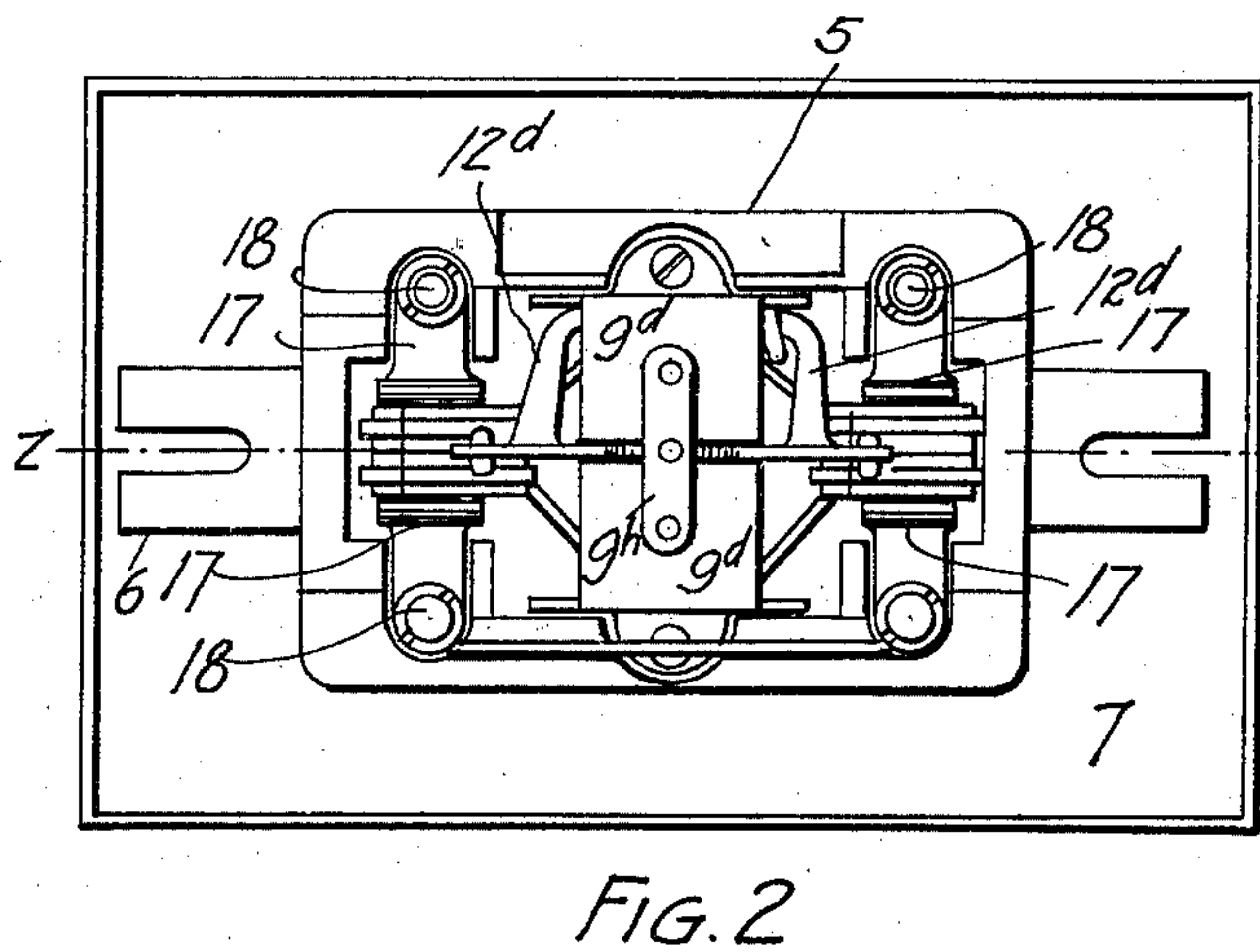
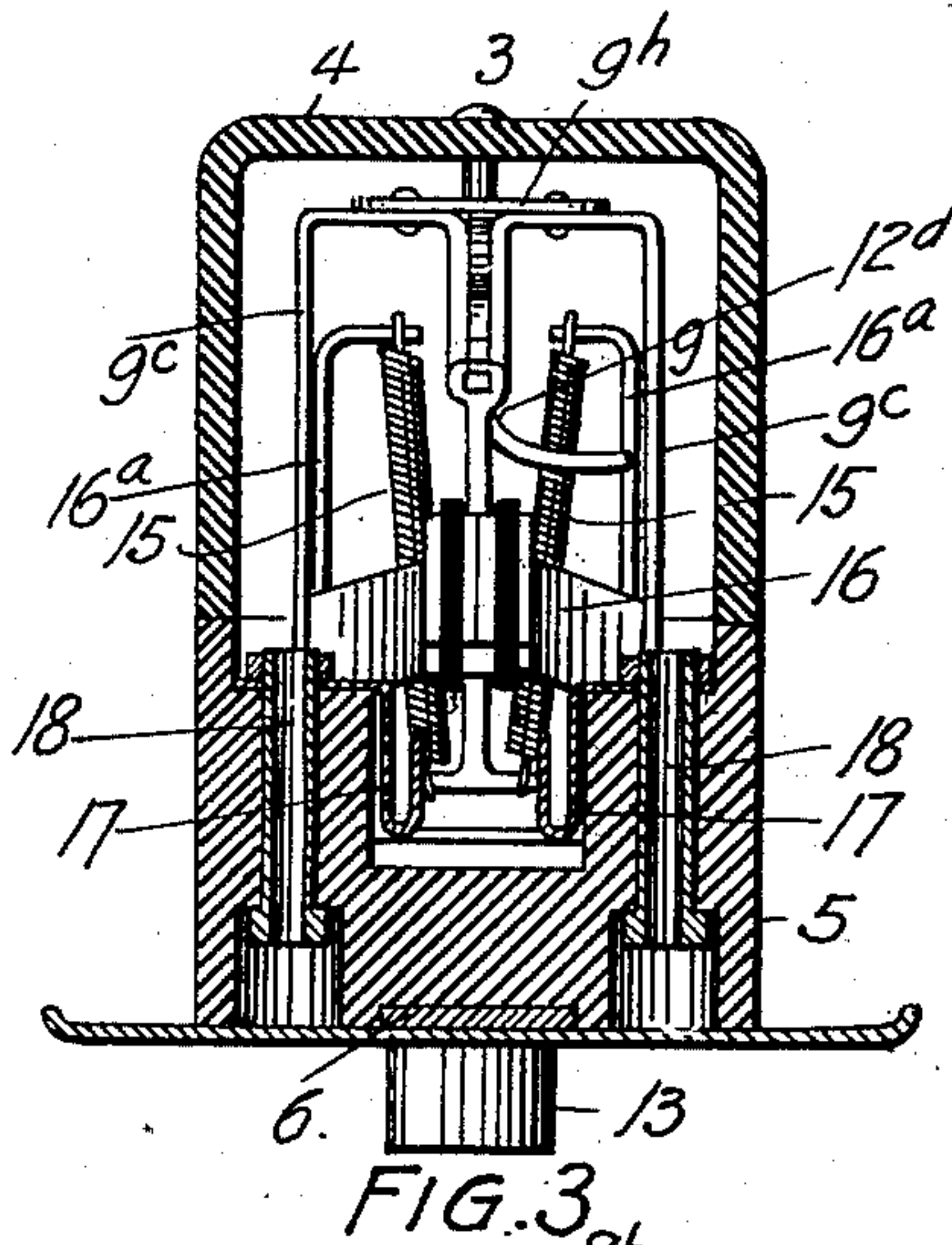
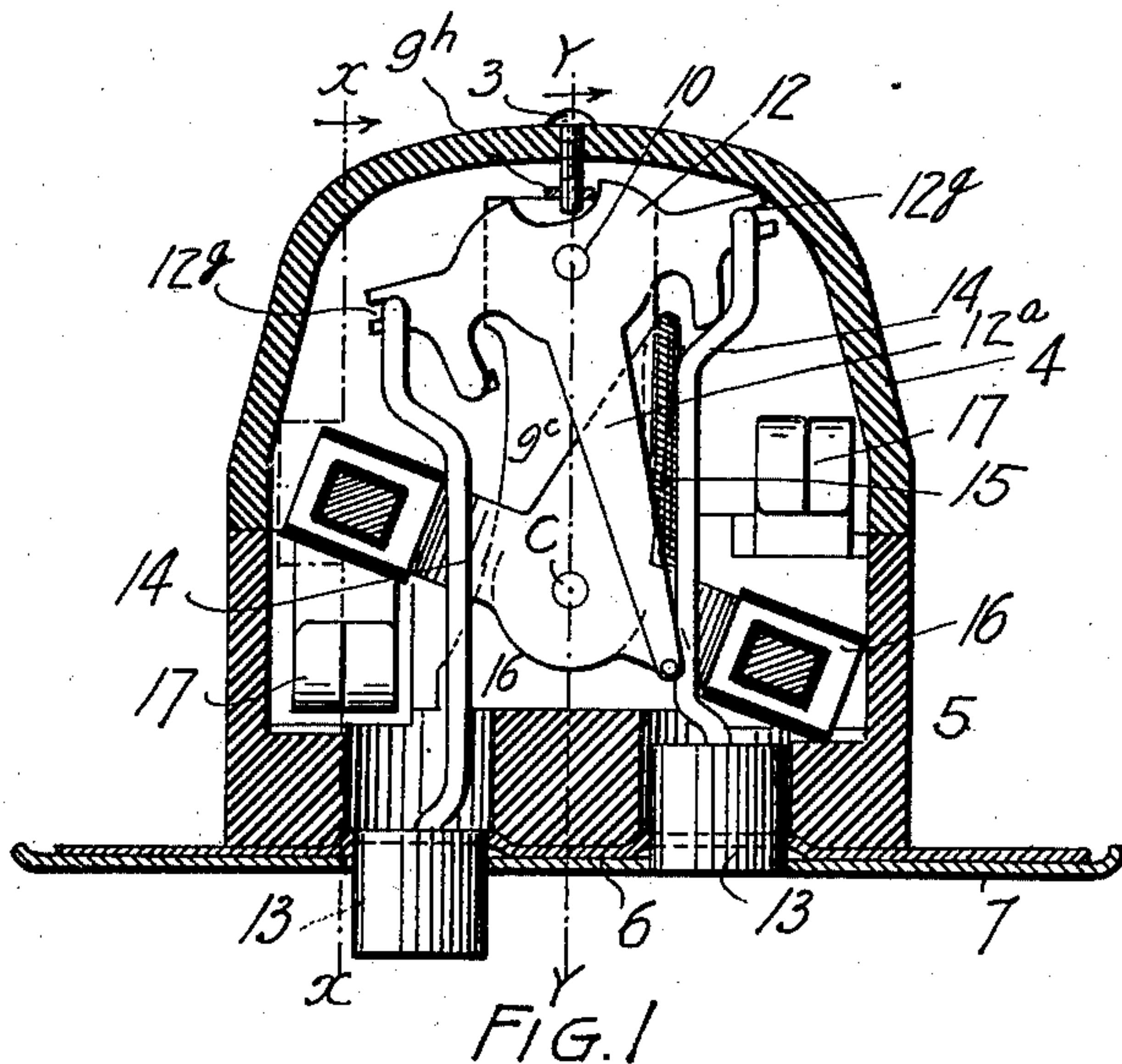


J. J. FLINT.
ELECTRIC SWITCH.

(Application filed July 29, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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J. J. FLINT.
ELECTRIC SWITCH.

(Application filed July 29, 1901.)

(No Model.)

2 Sheets—Sheet 2.

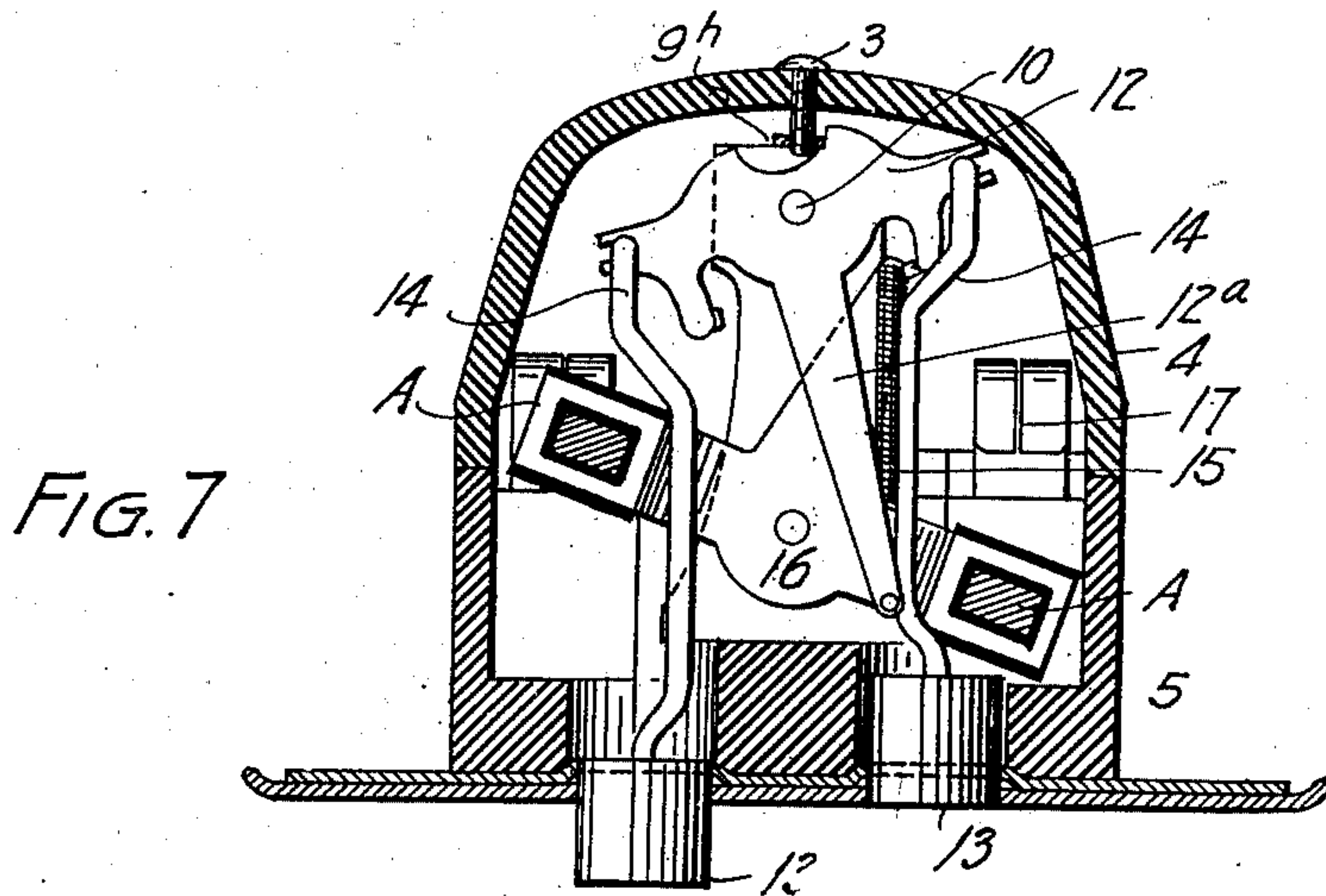


FIG. 7

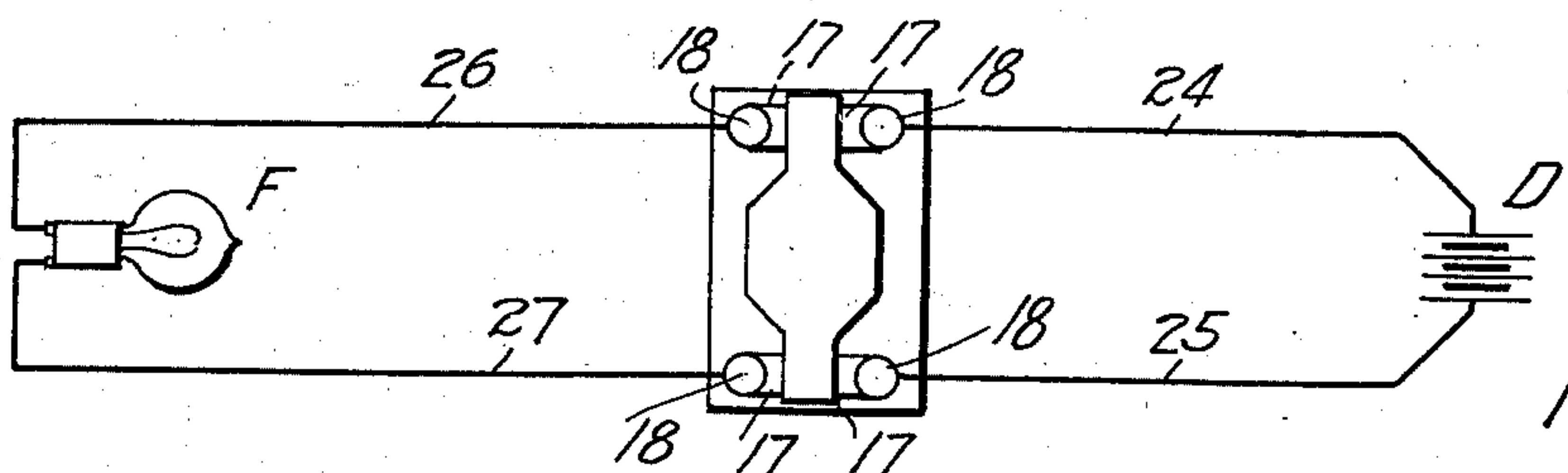


FIG. 8.

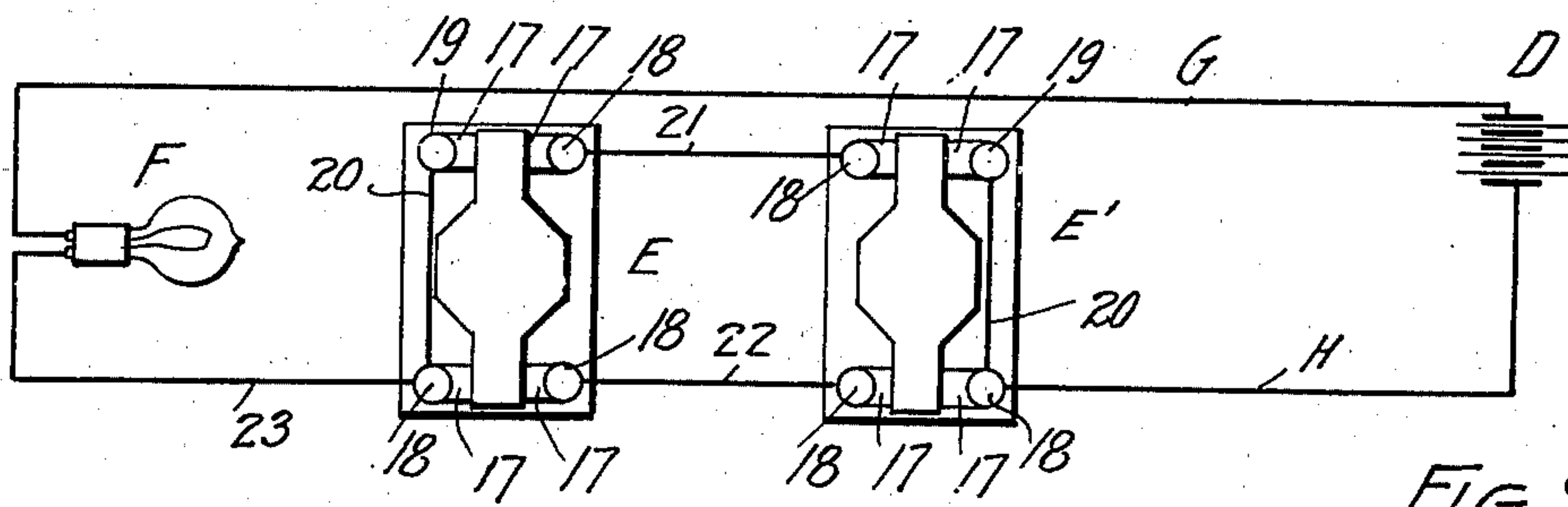


FIG. 9

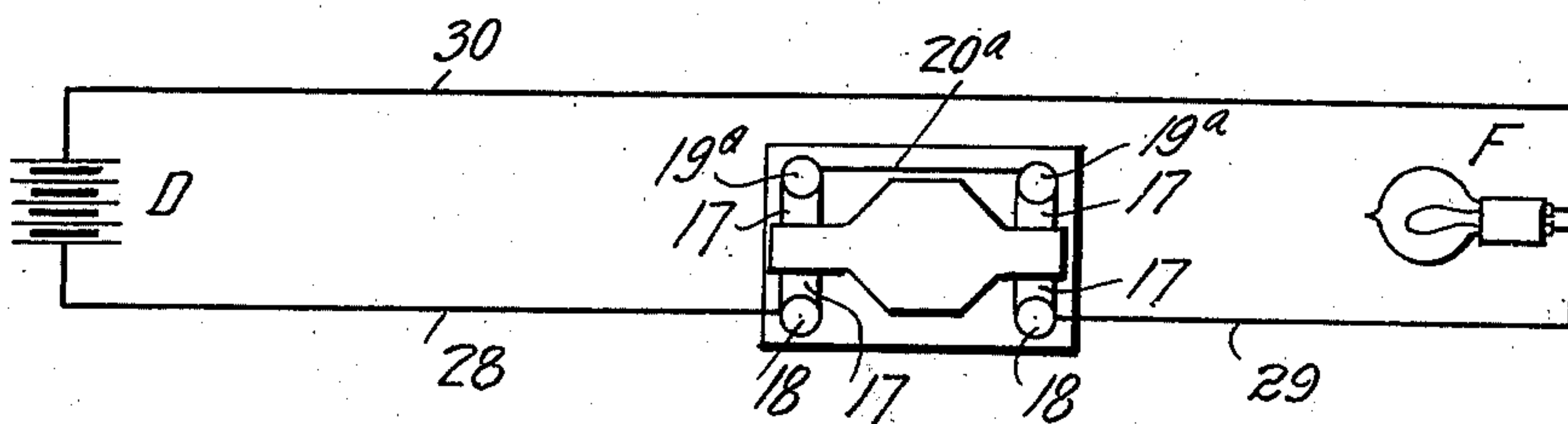


FIG. 10.

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UNITED STATES PATENT OFFICE.

JAMES J. FLINT, OF DENVER, COLORADO, ASSIGNOR TO THE FLINT-LOMAX
ELECTRIC AND MANUFACTURING COMPANY, OF DENVER, COLORADO.

ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 702,364, dated June 10, 1902.

Application filed July 29, 1901. Serial No. 70,022. (No model.)

To all whom it may concern:

Be it known that I, JAMES J. FLINT, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Electric Switches; 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.

My invention relates to improvements in electric switches; and it consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a vertical longitudinal section taken through my improved switch on the line *z z*, Fig. 2. Fig. 2 is a rear view of the switch, the porcelain cover being removed to disclose the mechanism within. Fig. 3 is a cross-section taken on the line *x x*, Fig. 1. Fig. 4 is a section taken on the line *y y*, Fig. 1. Figs. 5 and 6 are sections taken through one extremity of the rocking bar, illustrating the means for completing the circuit through the bar extremities, while the body of the bar is insulated from the current. In Figs. 1 to 4, inclusive, the double-pole construction is illustrated. Fig. 7 is a vertical longitudinal section taken through the three-way form of switch. This view is similar to Fig. 1; but the brushes are differently arranged. Fig. 8 is a diagrammatic view illustrating the circuit of the double-pole form of switch. Fig. 9 is a similar view illustrating the use of the three-way form of switch. Fig. 10 is a view illustrating the wiring connections of the single-pole double-break form of my improved switch mechanism.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a base, preferably composed of porcelain. To the front side of this base is attached a narrow metal plate 6, having push-button openings regis-

tering with corresponding openings in the face-plate 7, the latter being attached to the plate 6. Attached to the base on the inside by means of screws 8 is a metal frame 9, which, as shown in the drawings, is formed from an integral piece of metal and comprises a part 9^a and separated inwardly-projecting parts 9^c, parallel with each other, and two parts 9^d, bent toward each other and thence outwardly. These extremities are connected by a rivet 10, which forms the fulcrum or pivot of a rocking plate 12, which projects equally on opposite sides of the pivot. The extremities 9^d of the frame are further connected by a bridge-piece 9^h, secured thereto and connected with the porcelain cover 4 by a screw 3. The extremities 12^s of the plate 12 are respectively connected with the push-buttons 13 by rods or links 14. The plate 12 has an outwardly-projecting arm 12^a, whose extremity remote from the plate is provided with a cross-piece 12^c. To each extremity of this cross-piece is attached a coil-spring 15.

Fulcrumed or pivotally mounted on the frame 9 at a point C between the plate 12 and the base 5 is a rocking-bar 16, provided with two centrally-located and inwardly-projecting parallel arms 16^a, whose inner extremities 16^c are bent toward each other. The extremities of the coil-springs 15 remote from the cross-piece 12^c are connected with these arm extremities 16^c. These springs are normally under sufficient tension to hold the parts firmly in either position of adjustment. Each extremity of the plate 12 is provided with a lateral projection 12^d, which engages the adjacent arm 16^a of the bar 16, and thus aids in the tilting or shifting of the bar 16.

Suitably mounted on each extremity of the base 5 is a pair of brushes 12, preferably composed of copper and connected with the hollow binding-posts 18, to which the circuit-wires are attached. The extremities of the rocking-bar 16 are provided with contacts insulated from the body of the bar, whereby the circuit is completed through the brushes when the contact extremities of the rocking-bar engage the brushes.

Two different contact constructions are shown in Figs. 5 and 6 and designated A and B, respectively. As shown in the drawings,

the bar 16 is composed of two plates which are separated in the middle, allowing certain of the operating parts to pass through the opening. The extremities of these arms are brought together or in suitable proximity and bored to allow the contact-studs A' or B' to pass therethrough, the stud being surrounded by insulating material, which is designated A² and B² in Figs. 5 and 6. In Fig. 5 contact-plates A³ are shown applied to the extremities of the stud A', while in Fig. 6 the extremities of the stud are enlarged or upset to give the required contact-surface. In the double-pole form of switch the two pairs of brushes are so arranged (see Fig. 1) that both contact extremities of the bar engage the two pairs of brushes at the same time. Hence the circuit is made and broken at both pairs of brushes simultaneously by the bar 16. When the parts are in the open-circuit position, as shown in Fig. 1, and it is desired to close the circuit, it is only necessary to push inwardly on the protruding button 13. This action imparts a corresponding movement to the extremity of the plate 12, with which the corresponding link or rod 14 is connected, with the result that an opposite movement will be imparted to the other extremity of the said plate, thus throwing the arm 12^a toward the left, its extremity connected with the springs 15, moving in the arc of a circle whose center is the fulcrum-point of the plate 12. At the same time the projections 12^d act on the arms 16^a and move the arms toward the left, the extremities of said arms connected with the springs moving in the arc of a circle whose center is the fulcrum-point C. In other words, the points to which the springs are attached are moved farther apart and the tension of the springs is increased. Hence as soon as the extremity of the arm 12^a passes beyond or to the left of a straight line connecting the points 16^c and C the power of the spring acting on the arms 16^a pulls the said arms toward the left to their limit of movement, thus shifting the bar 16 and throwing its extremities into engagement with the two pairs of brushes 17.

In Fig. 7 the same construction is shown as in Fig. 1, but the brushes are differently arranged—that is to say, so that the one extremity of the bar 16 is in contact with a pair of brushes when the other extremity is disengaged from its corresponding pair of brushes. Hence with this arrangement of brushes the circuit is always closed through one pair of brushes no matter which of the two positions the operating parts occupy. This form of the switch, which I have termed the "three-way" form, is diagrammatically illustrated in Fig. 9, being employed where it is desired to control the current at two different points. In this view D designates the electric source, E E' two of the switches, and F the electric lamp to be controlled. A wire G leads from one pole of the source directly to the lamp. Another wire H leads from the other pole of the source to the binding-post 18 of the switch

E', which post is connected with a post 19 by a wire 20. The two adjacent posts 18 of each switch E E' are connected by wires 21 and 22, while from one of the binding-posts of the switch E a wire 23 leads to the lamp F. In this case it is evident that the circuit may be completed through H, one pair of brushes of switch E', the wire 22, one pair of brushes of the switch E, and the wire 23, or through a binding-post 18 of switch E', the wire 20 of switch E', the other pair of brushes of switch E', wire 21, the other pair of brushes of switch E, the wire 20 of switch E, a binding-post 18 of switch E, and the wire 23.

The wiring of the double-pole form of construction, or that shown in Fig. 1, is illustrated in Fig. 8, in which D is the source of current, 24, 25, 26, and 27 the circuit-wires, and F the lamp.

The circuit of the single-pole double-break form of switch is illustrated in Fig. 10. In this form the brushes are arranged as in Fig. 1, so that the circuit is simultaneously broken at both pairs of brushes. However, two of the posts, which I will designate as 19^a, are simply contacts performing the function of binding-posts so far as the brushes 17 are concerned, but which are not directly connected with exterior circuit-wires. These two contacts are connected by a wire 20^a, which performs the same function as the wires 20 of the switches E E' in Fig. 9. In Fig. 10 D is a source of current, F the lamp, and 28, 29, and 30 the circuit-wires.

Having thus described my invention, what I claim is—

1. In an electric switch, the combination with a switch-base, push-buttons, and a frame attached to the base, of a rocking plate pivoted on the frame at its inner extremity and projecting laterally on opposite sides of said pivot, the plate having an outwardly-projecting arm, a rocking bar pivoted on the frame between the rocking plate and the push-buttons, and provided with a central opening into which the outwardly-projecting arm of the rocking plate passes, the rocking bar having inwardly-projecting arms arranged on opposite sides of the arm of the rocking plate, the outer extremity of the rocking-plate arm having a cross-piece, coil-springs connecting the respective extremities of the cross-piece with the inner extremities of the rocking-bar arms, and rods or links passing through the central opening of the rocking bar, and connecting the extremities of the rocking plate on opposite sides of the pivot, with the push-buttons.

2. In an electric switch, the combination with a switch-base and push-buttons, of a frame attached to the base and having two separated inwardly-projecting parts whose inner extremities are bent toward each other, a rocking plate mounted between the inner extremities of the frame parts, a rivet connecting the said frame-part extremities and forming the fulcrum of the rocking plate

which is provided with an arm, a rocking bar pivoted on the frame and provided with an arm, the plate and the bar being separated and having their arms projecting in opposite 5 directions, a spring connecting the arms of the two parts and arranged to hold them firmly in either position of adjustment, and two links or rods attached to the push-buttons and connecting the rocking plate on opposite 10 sides of its fulcrum.

3. In an electric switch, the combination with a base, a frame and push-buttons, of a rocking plate fulcrumed on the inner extremity of the frame, having laterally-projecting arms and an outwardly-projecting arm, a rocking bar pivoted on the frame and centrally bifurcated, the said bar being located between the rocking plate and the push-buttons, its opposite extremities being provided with contacts insulated from the body of the arm, the arrangement being such that the inwardly-projecting arm of the rocking plate passes into the central opening of the rocking bar which is provided with two inwardly-projecting arms, one extending from each part of its bifurcated portion, coil-springs connecting the inner extremities of the rocking-bar arms, with the outer extremity of the rocking-plate arm, and rods or links connecting the rocking plate on opposite sides of its pivot with the respective push-buttons. 25 30

4. In an electric switch, the combination with a base, a frame and push-buttons, of a rocking plate pivoted on the frame at its inner extremity, projecting equally on opposite sides from said pivot, the parts on the opposite sides of the pivot, having lateral projections, the rocking plate having also an outwardly-projecting arm, a rocking bar fulcrumed on the frame between the rocking plate and the push-buttons, said bar being centrally bifurcated, its extremities having contacts insulated from the body of the bar which is provided with two inwardly-projecting arms, one extending from each part of its bifurcated portion, one of the said rocking-bar arms projecting into the path of the said lateral projections of the rocking plate, coil-springs connecting the outer extremity of the rocking-plate arm, with the inner extremities of the rocking-bar arms, and links or rods connecting the rocking plate with the push-buttons. 45 50

5. In an electric switch, the combination with a base, a frame, push-buttons, and brushes, of a rocking plate pivoted on the inner extremity of the frame and provided with parts extending equally on both sides of its pivot, and an outwardly-projecting arm, a rocking bar fulcrumed on the frame between the rocking plate and the push-buttons, said bar being centrally bifurcated, and its extremities being provided with contacts insulated from the body of the bar and arranged to engage the brushes, the inwardly-projecting arm of the rocking plate projecting into a central opening of the bar, the said bar having an arm projecting inwardly from each bifurcated part, coil-springs connecting the inner extremities of the rocking-bar arms with the outer extremity of the rocking-plate arm, and links passing through the central opening of the rocking bar, and connecting the rocking plate with the push-buttons. 55 60 65 70

6. In an electric switch, the combination with a base, a cover, push-buttons and brushes, of a frame attached to the base and having two separated inwardly-projecting parts whose inner extremities are bent toward each other, a bridge-piece connecting said extremities and secured to the cover, a rocking plate pivoted between the inner extremities of the frame parts, and provided with an outwardly-projecting arm, a rocking bar fulcrumed on the frame between the rocking plate and the push-buttons, its central part being bifurcated and its extremities having contacts insulated from the body of the bar and arranged to cooperate with the brushes, the arm of the rocking plate entering the central opening of the said bar which is provided with inwardly-projecting arms, one arm extending from each part of the bar's bifurcated portion, the rocking plate being provided with projections arranged to engage one of the rocking-bar arms, coil-springs connecting the arm of the rocking plate with the arms of the rocking bar, and rods or links connecting the rocking plate with the push-buttons, substantially as described. 75 80 85 90 95 100

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

JAMES J. FLINT.

Witnesses:

A. J. O'BRIEN,
DENA NELSON.