

(No Model.)

S. BERGMANN.
SWITCH FOR ELECTRIC CIRCUITS.

No. 400,733.

Patented Apr. 2, 1889.

Fig. 1

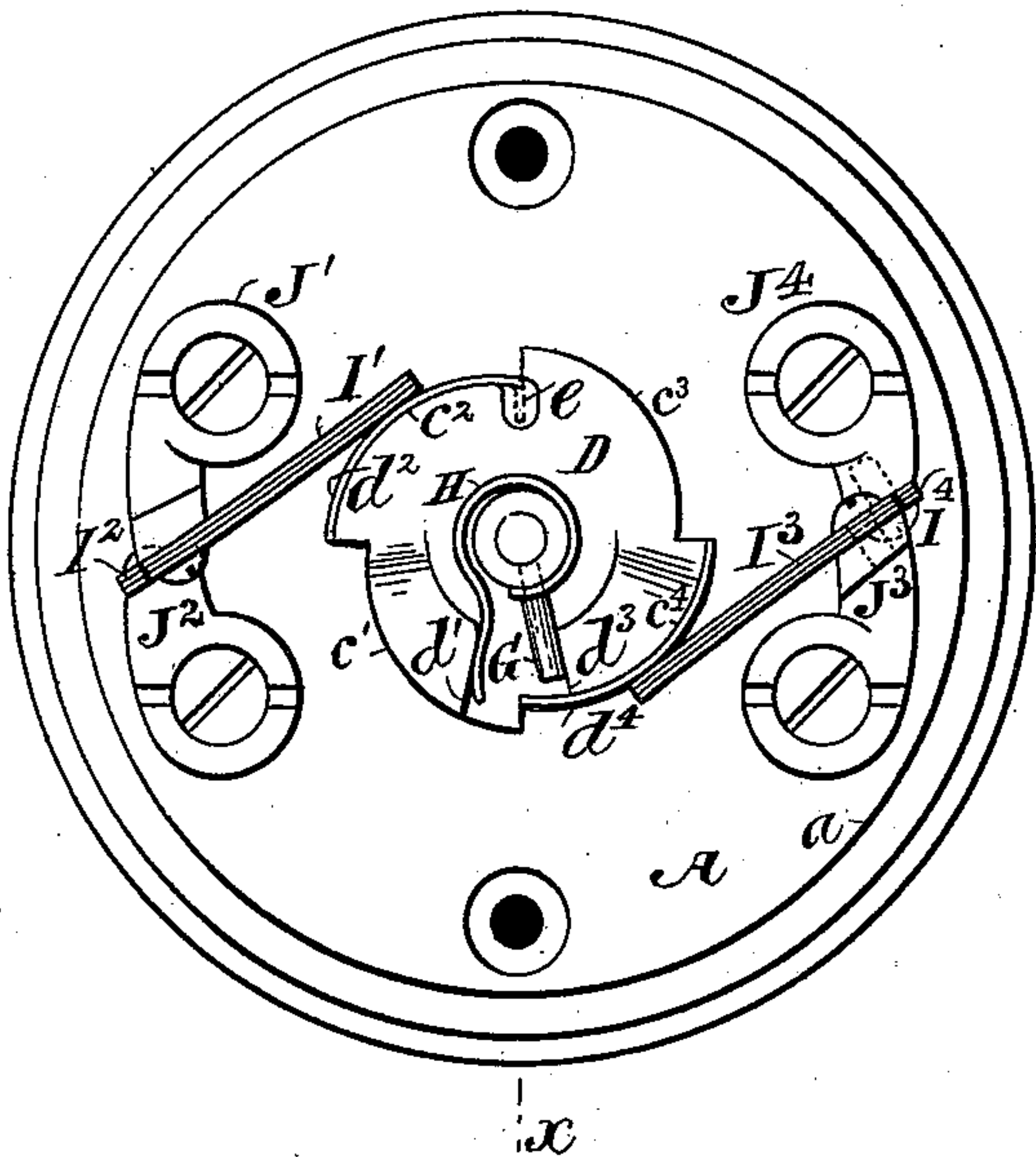


Fig. 4

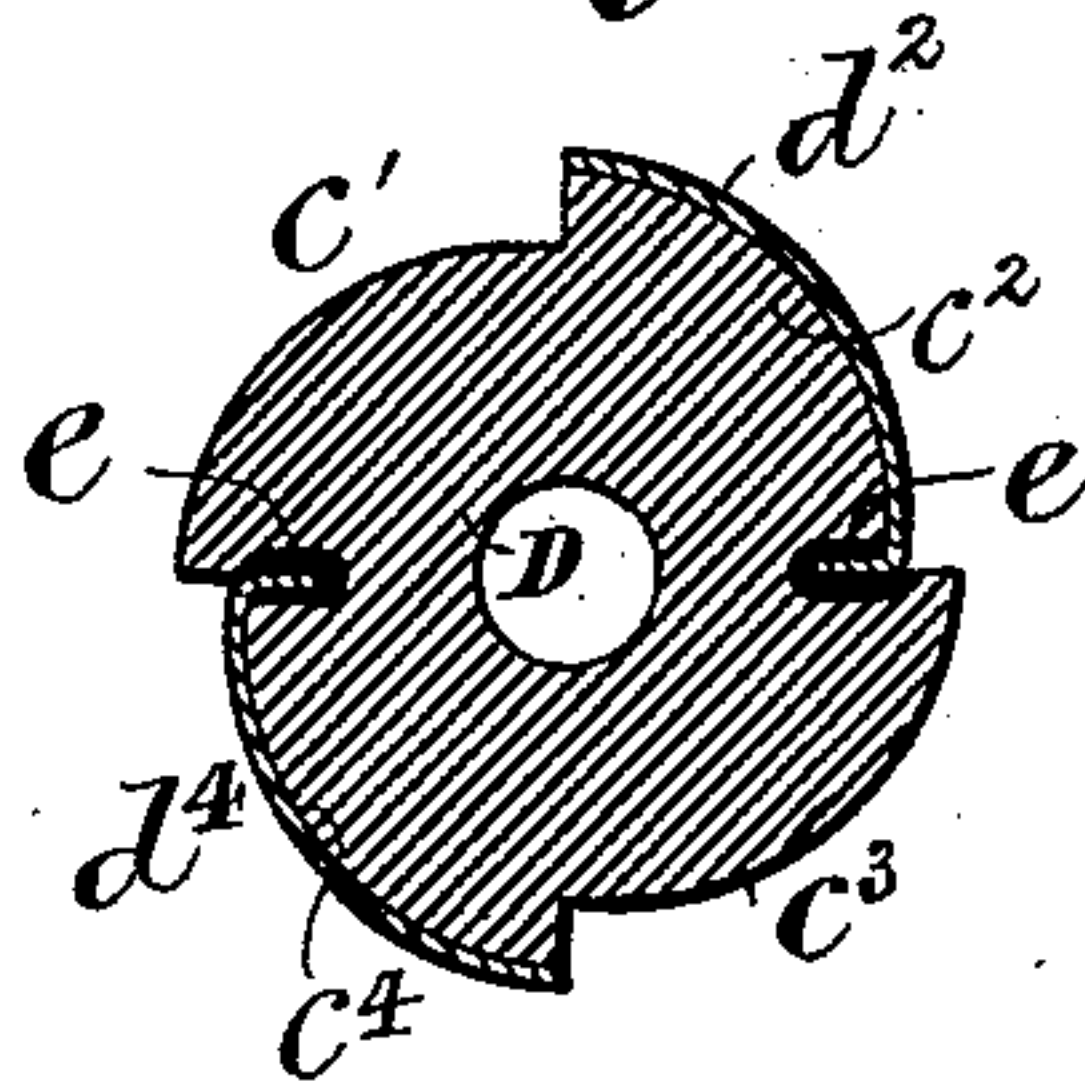


Fig. 3

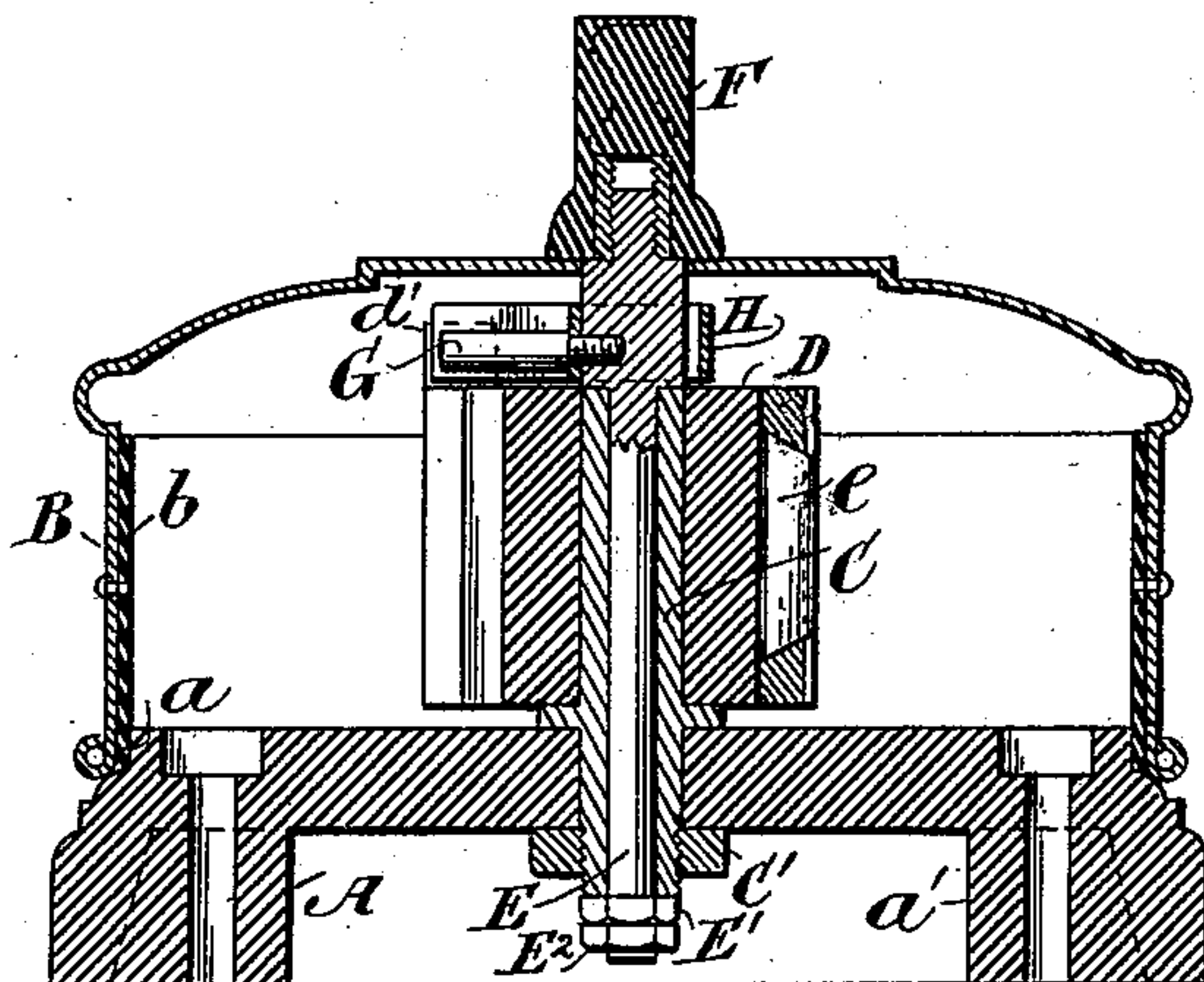
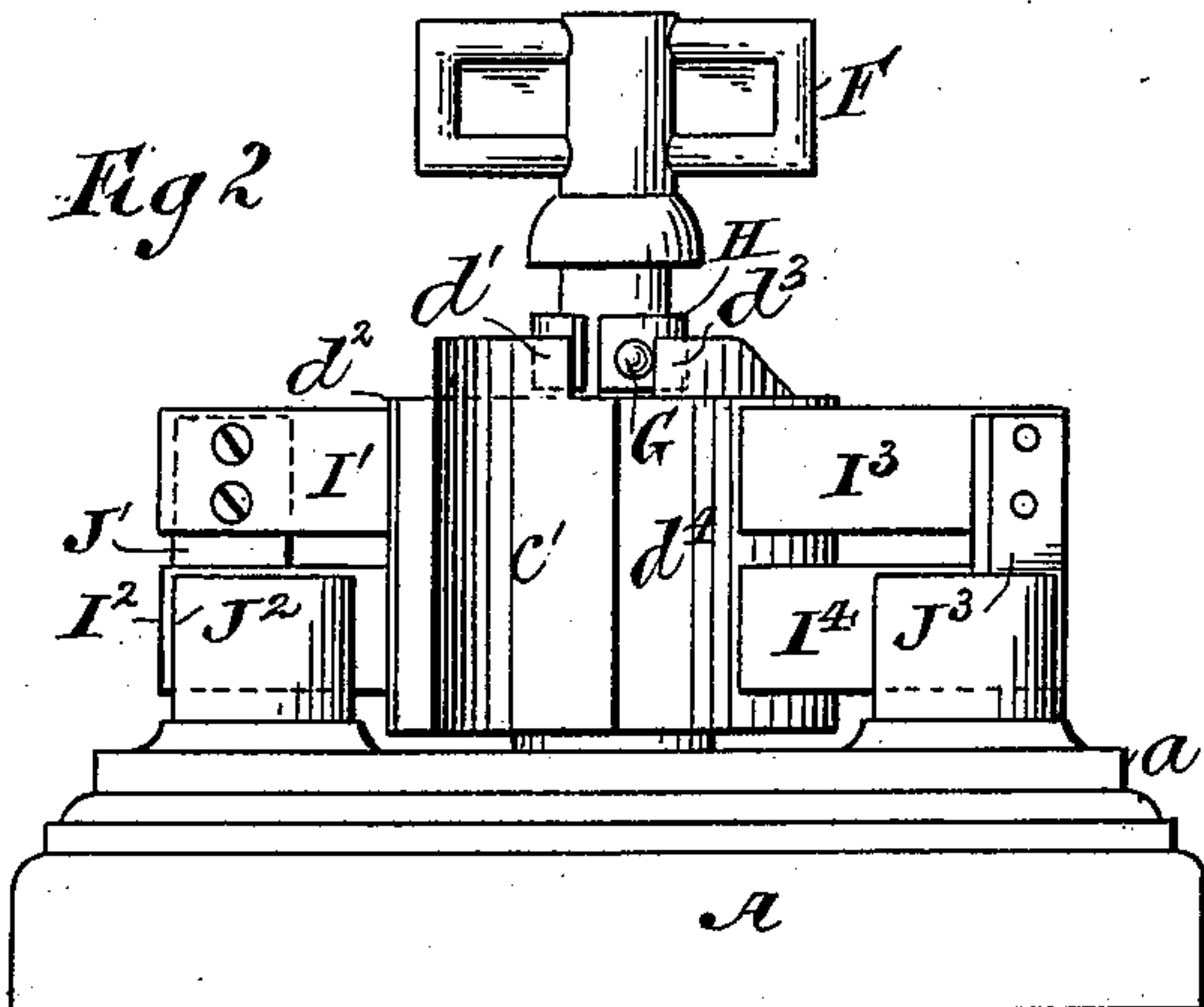
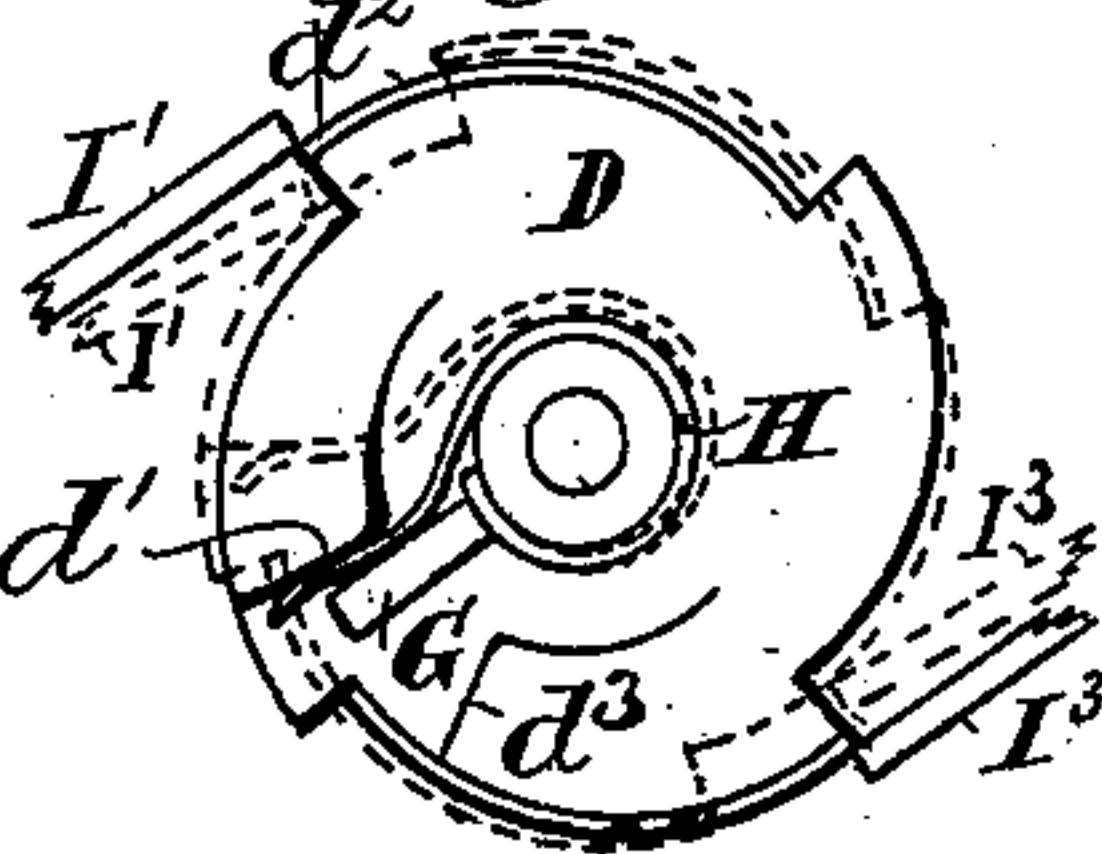


Fig. 2



Figs



Witnesses
James D. Griswold
Maurice J. Roach.

Inventor
S. Bergmann
By his attorneys
Gifford & Brown.

UNITED STATES PATENT OFFICE.

SIGMUND BERGMANN, OF NEW YORK, N. Y., ASSIGNOR TO BERGMANN & COMPANY, OF NEW YORK.

SWITCH FOR ELECTRIC CIRCUITS.

SPECIFICATION forming part of Letters Patent No. 400,733, dated April 2, 1889.

Application filed Jan. 18, 1888. Serial No. 274,262. (No model.)

To all whom it may concern:

Be it known that I, SIGMUND BERGMANN, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Switches for Electric Circuits, of which the following is a specification.

I will describe a switch embodying my improvement, and then point out the novel features in the claims.

10 In the accompanying drawings, Figure 1 is a plan or top view of a switch embodying my improvement, the handle, and also a cover which is preferably used, being removed. Fig. 2 is a side view of this switch with the
15 cover removed. Fig. 3 is a central vertical section of the switch, taken at the plane of the dotted line xx , Fig. 1, the cover being in place. Fig. 4 is a horizontal section of a wheel forming part of the switch. Fig. 5 is a
20 top view of the switch-wheel and of the appurtenances which impinge upon the same.

Similar letters of reference designate corresponding parts in all the figures.

25 A designates a base-piece, here shown as of circular form.) It is preferably made of porcelain, glass, or analogous incombustible material. It is shown as provided near the top with a circumferential rabbet, a , adapted to receive a cover, B. This cover may be
30 made of sheet metal. As here shown, it is provided at a certain portion with a lining of insulating material, b .

35 The base-piece is shown as provided in the under side with a central cavity, a' , which may be of circular form.

40 C designates an upright cylindric shell. Its lower end fits in a central hole in the base-piece A. Near the lower end it is provided with a flange which rests upon the top of the base-piece A. At the lower extremity this shell is externally screw-threaded, and has applied to it below the central portion of the base-piece a nut, C' . This nut, together with the flange, secures the shell in an upright position firmly to the base-piece. This shell may
45 be made of metal. It is not intended to turn or rotate.

50 D designates a switch-wheel. It is made of porcelain, glass, or like incombustible fictile material. Through its center extends a hole

of suitable size to fit the exterior of the shell C. This wheel rests upon the flange of the shell C, and is free to turn about the shell.

The exterior or periphery of the wheel D is composed of a number of spiral segment-sur- 55 faces, $c' c^2 c^3 c^4$, and intermediate radial portions. I have shown four of said spiral segment-surfaces. They are approximately of the same shape as ordinary ratchet-teeth. The segment-surfaces $c^2 c^4$, which are opposite each 60 other and intermediate of the segment-surfaces $c' c^3$, are faced with strips of metal, $d^2 d^4$, which may advantageously be copper. These strips of metal are secured in place, as here shown, by being bent at one end, so as 65 to form tongues e , which extend into slots formed radially in the wheel D.

It will be seen by reference to Fig. 3 that the tongues e are flared toward their extremities. Babbitt metal is poured into the slots in 70 the wheel around the tongues e while in a liquid state, and on setting secures the tongues firmly in the slots. The strips of metal $d^2 d^4$ are co-extensive with the segment-surfaces $c^2 c^4$.

E designates a shaft fitted into the upright 75 shell C and capable of rotating therein. It extends below the shell C, and has nuts $E' E^2$ applied to it below the shell to secure it in place within the shell. Above the shell it is provided with a shoulder that extends over 80 the upper end of the shell. The upper end of this shaft is provided with an externally-screw-threaded boss, to which a hand-piece, F, is secured by means of a screw-threaded cavity. This hand-piece serves as a means 85 for turning the shaft.

G designates a pin extending radially from the shaft E above the switch-wheel D. This pin is shown as secured to the shaft by being screwed into the latter. It also serves the 90 purpose of securing to the shaft one end of a spring, H, which is coiled loosely around the shaft and has its free end extended toward the direction of the periphery of the switch-wheel. The switch-wheel has upon its upper 95 surface two projections, $d' d^3$. The pin G extends between these projections. So does the free end of the spring H. The opposite faces of the projections $d' d^3$ are at a considerable distance apart. Normally the pin G bears 100

against the projection d^3 , and the free end of the spring H bears against the projection d' .

It will be remembered that the switch-wheel is free to turn loosely around the upright shell C. It derives its motion from the shaft E; but this shaft is capable of transmitting motion to the switch-wheel only through the agency of the pin G and the spring H.

I' I^2 I^3 I^4 designate brushes, consisting of strips of metal secured to plates or posts J' J^2 J^3 J^4 , secured to the base-piece A by screws or otherwise, and adapted to have circuit-wires secured in electrical communication with them. These brushes at their free ends bear upon the periphery of the switch-wheel. They may bear at the same time upon the segment-surfaces c' c^3 , which are not faced with metal, or upon the intermediate segment-surfaces, c^2 c^4 , which are faced with the metal strips d^2 d^4 .

The plate or post J' is not in electrical communication with the plate or post J^2 . The brush I' is therefore electrically unconnected with the brush I^2 . The plates or posts J^3 J^4 and brushes I^3 I^4 are likewise unconnected. Therefore when the two pairs of brushes bear upon the metal strips d^2 d^4 electrical communication is established between the brushes I' I^2 and also between the brushes I^3 I^4 . When the two pairs of brushes touch the segment-surfaces c' c^3 of the switch-wheel, there will be no electrical communication between the brushes I' I^2 or between the brushes I^3 I^4 .

When the hand-piece F is turned so as to rotate the switch-wheel, the spring H will yield until the pin G comes in contact with it, as shown in full lines in Fig. 5. The further turning of the hand-piece will impart a corresponding rotary movement to the switch-wheel. When the opposite segment-surfaces are about to pass beyond the tips of the brushes, the spring H expands and throws the switch-wheel quite a considerable distance, as indicated by the dotted lines in Fig. 5. This action insures the carrying of the

strips d^2 d^4 entirely beyond the brushes.

It will be seen that the hand-piece F can only be operated to rotate the shaft E in one direction, for when turned in the opposite direction it will be unscrewed from the shaft. The wheel D cannot, therefore, be rotated in such a direction as to injure the brushes I' I^3 .

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a switch, the combination of a rotary part or wheel, a shaft around which the rotary part or wheel turns, a radial projection on the shaft, and a spring connected to the shaft, establishing a connection between the shaft and the rotary part or wheel, substantially as specified.

2. In a switch, the combination of a rotary part or wheel, an axle or support upon which the rotary part or wheel may turn, a shaft capable of turning relatively to the axle or support of the rotary part or wheel, a radial projection on the shaft, and a spring secured to the rotary shaft, establishing a connection between the said rotary shaft and the rotary part or wheel, substantially as specified.

3. In a switch, the combination, with a rotary part or wheel provided with tangential segment-surfaces, certain of which are of insulating material and the others of which are faced with conducting material, of a rotary shaft around which the rotary part or wheel turns, a pin radial from said shaft, and a spring fastened to the rotary shaft and extending outwardly therefrom between projections extending from the rotary part or wheel, substantially as specified.

4. In a switch, the combination of a rotary part or wheel, a rotary shaft around which the rotary part or wheel can turn, and provided with upwardly-extending projections, a pin extending radially from this shaft between the said projections of the rotary part or wheel, and a spring, also connected with the shaft and extending between the said projections, substantially as specified.

5. In a switch, the combination, with a rotary part or wheel, of a rotary shaft around which the rotary part or wheel can turn, and having a pin extending radially therefrom, a spring connected to said shaft, a hand-piece for imparting motion to the shaft and the rotary part, and having a screw-threaded connection with said shaft, and brushes contacting with the rotary part or wheel, substantially as specified.

SIGMUND BERGMANN.

Witnesses:

P. H. KLEIN, Jr.,
JNO. F. GEIDEL.