

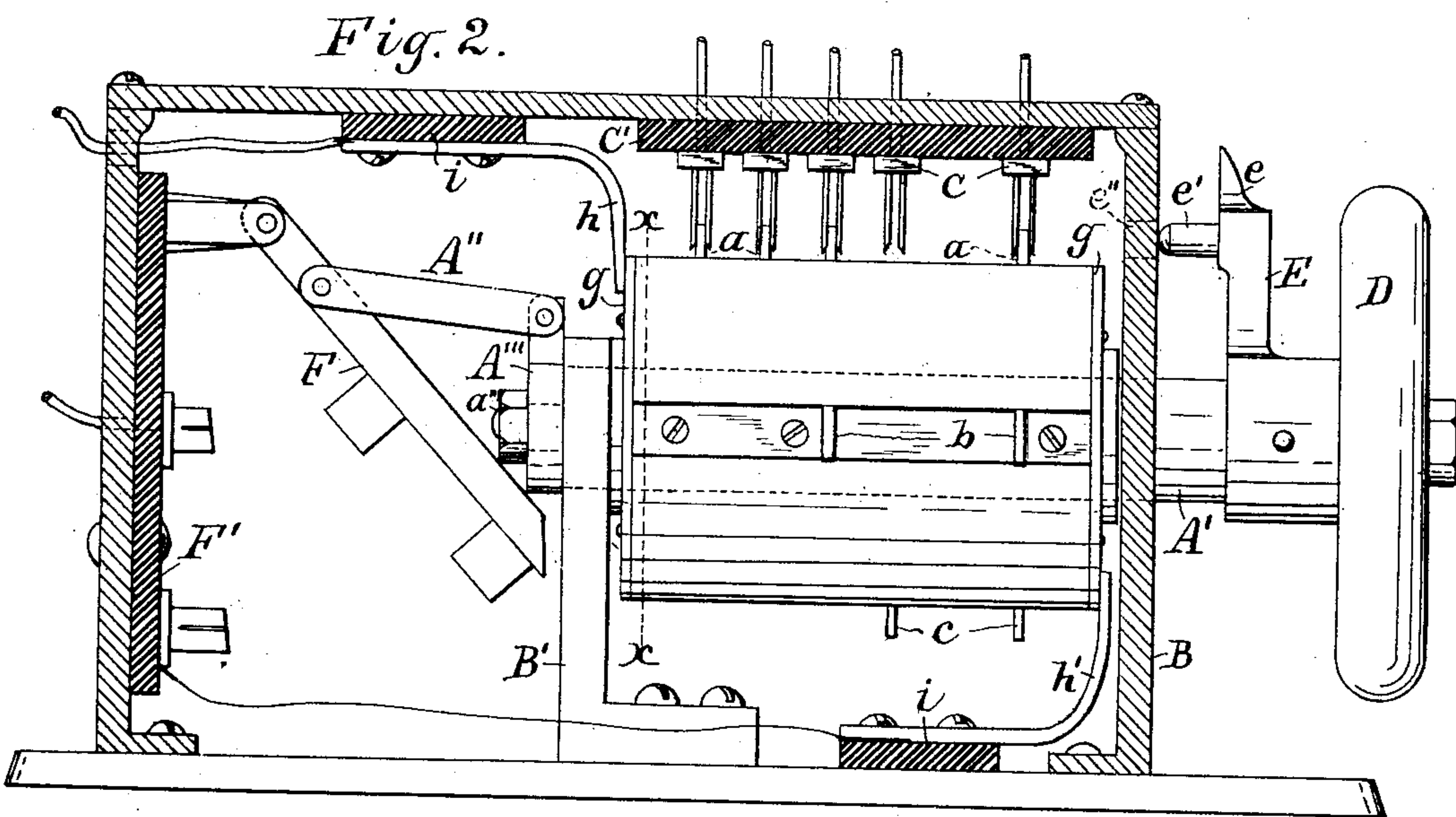
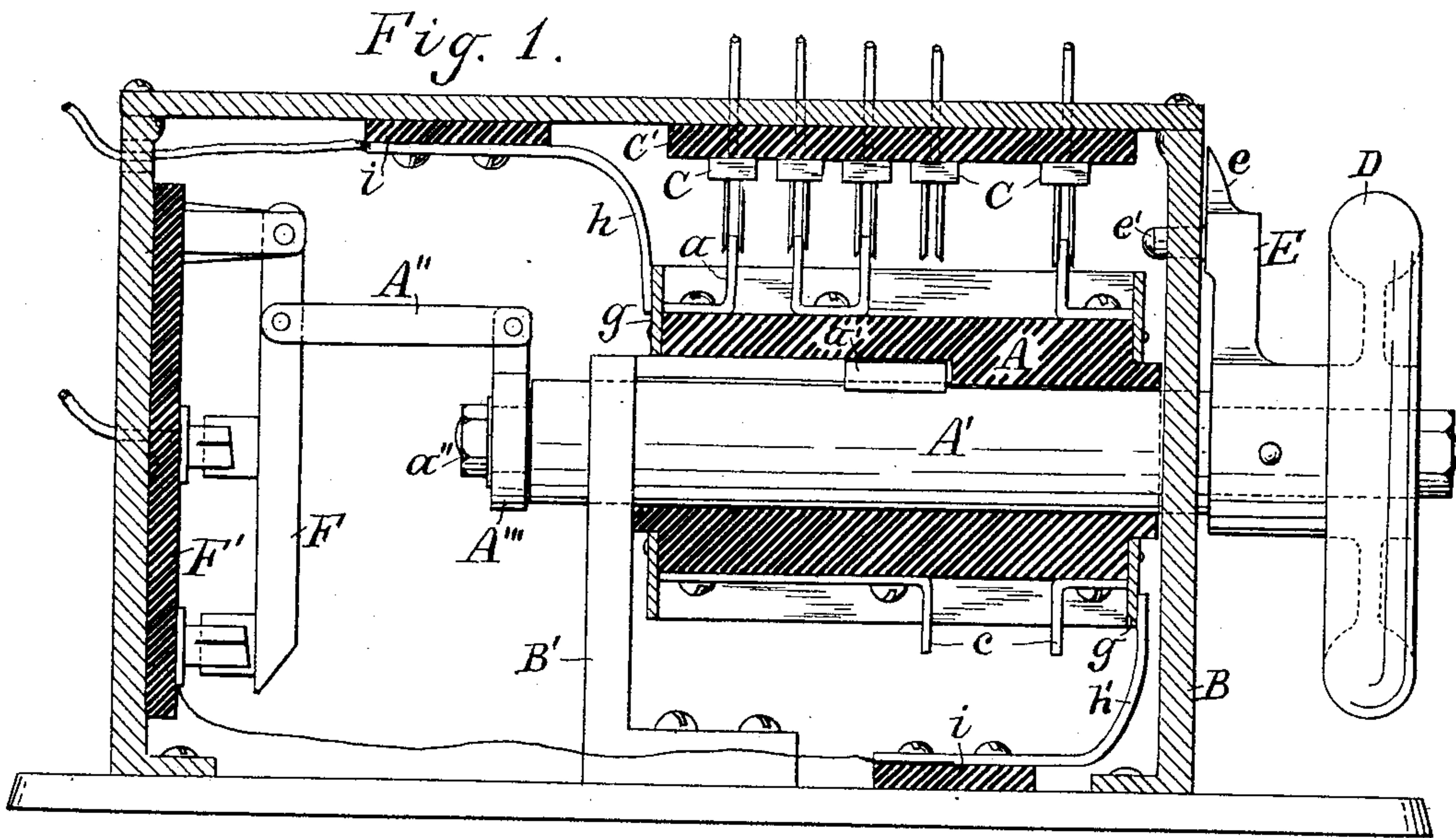
(No Model.)

3 Sheets—Sheet 1.

M. W. DEWEY.  
ELECTRIC SWITCH.

No. 535,533.

Patented Mar. 12, 1895.



Witnesses:

*A. S. Dewey.*

*H. M. Seamans*

Inventor.

*Mark W. Dewey*

*By C. H. Duell*

*his Attorney.*

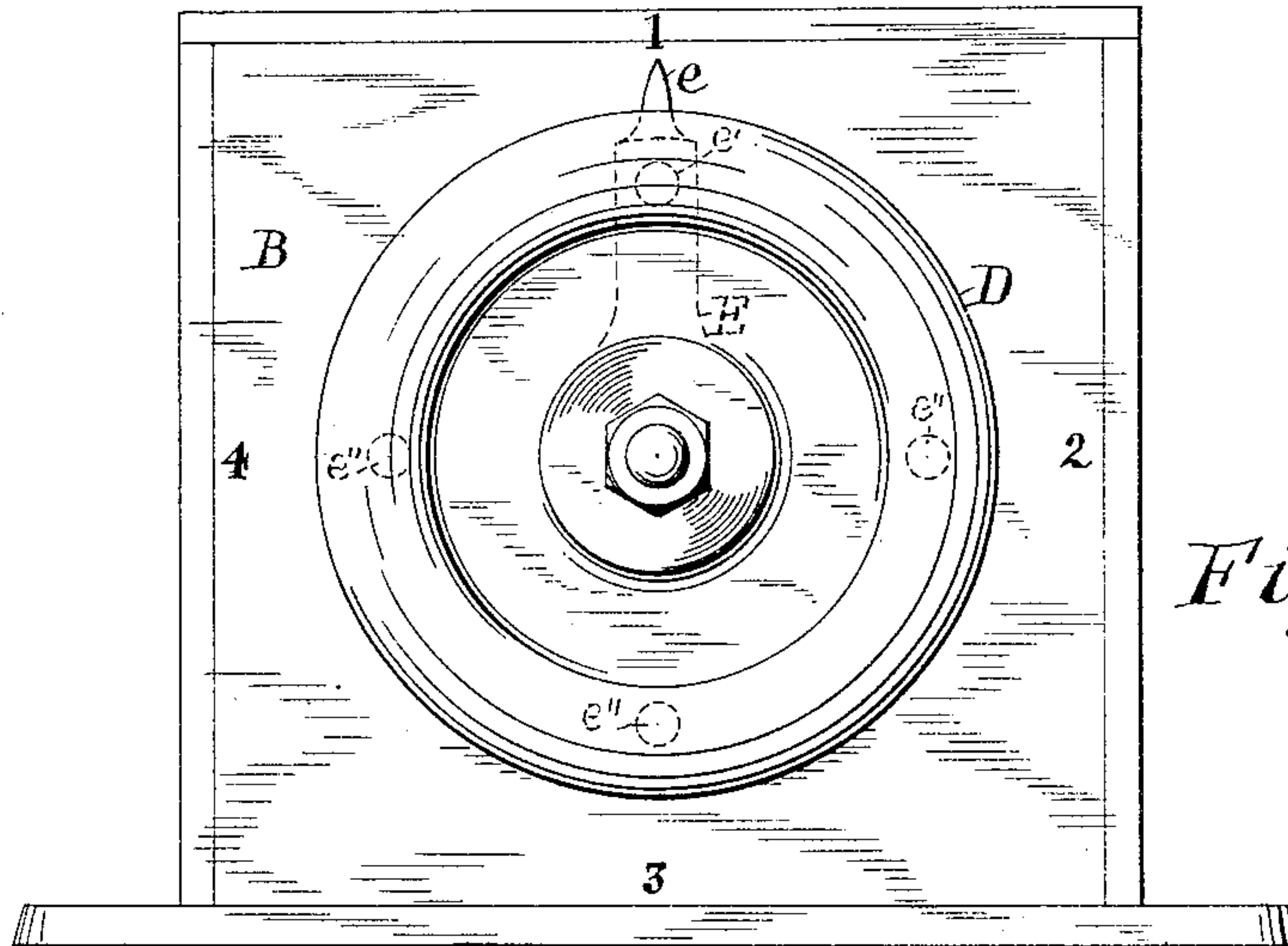
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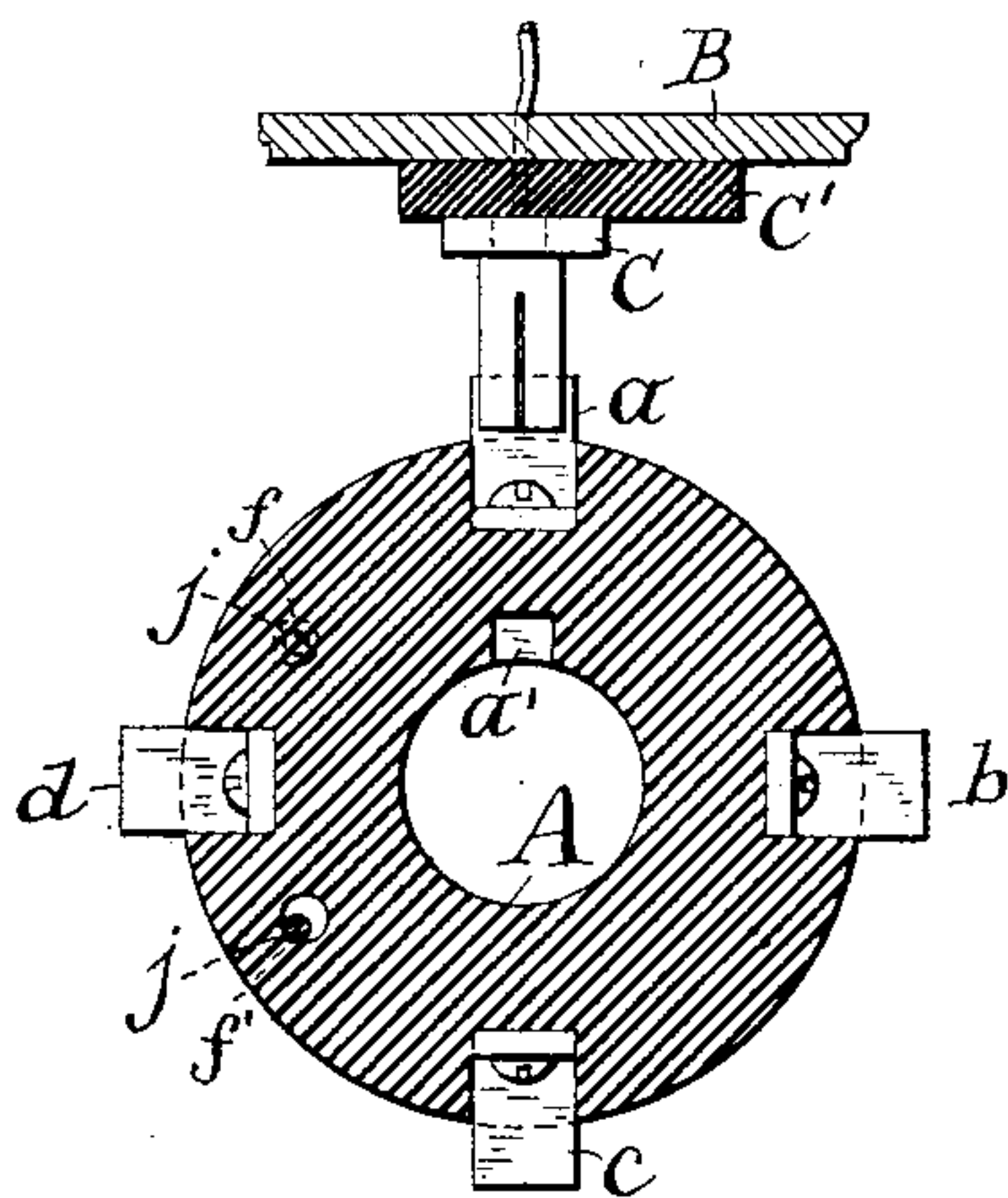
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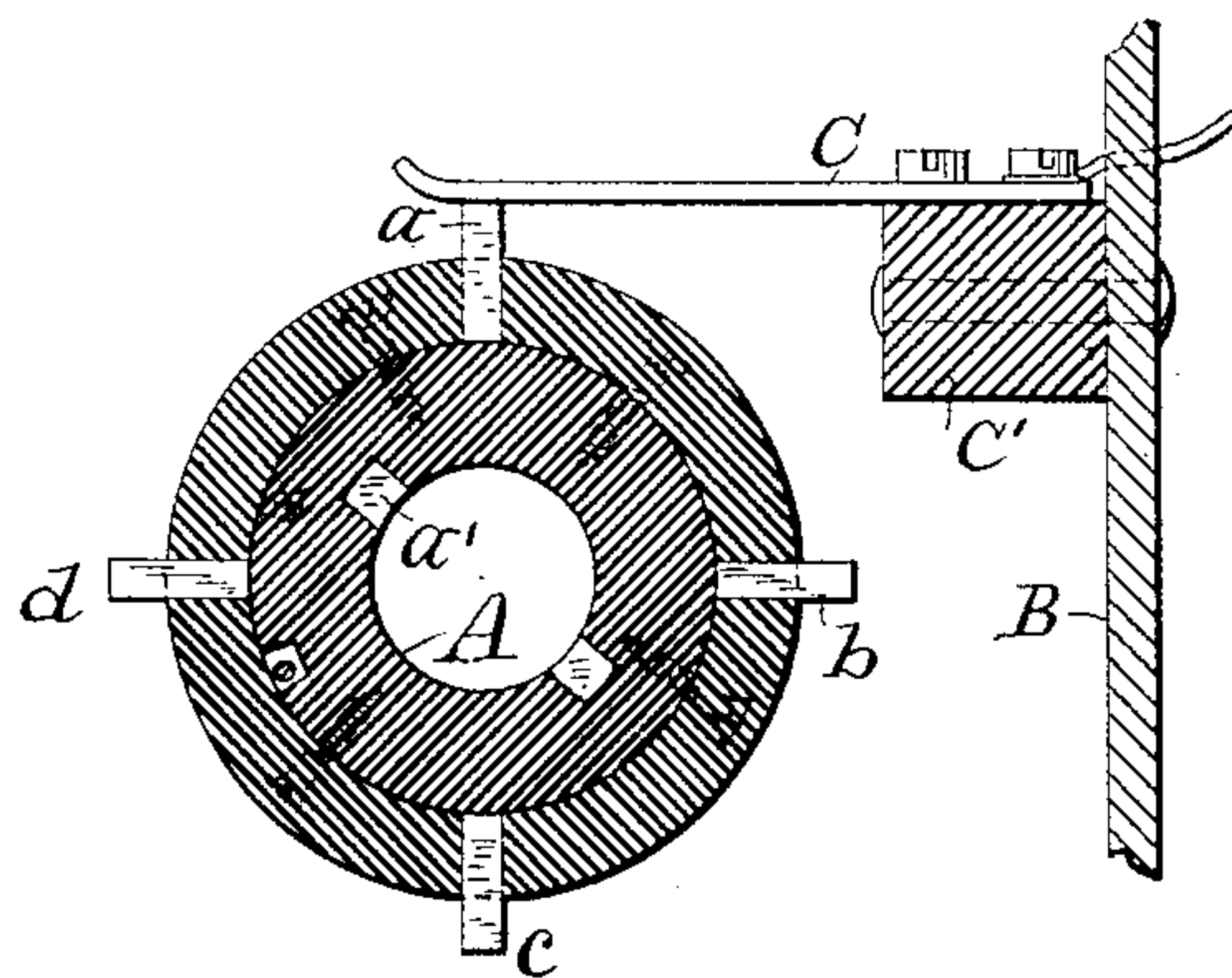
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*Fig. 3*



*Fig. 4.*



*Fig. 5.*

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(No Model.)

3 Sheets—Sheet 3.

M. W. DEWEY.  
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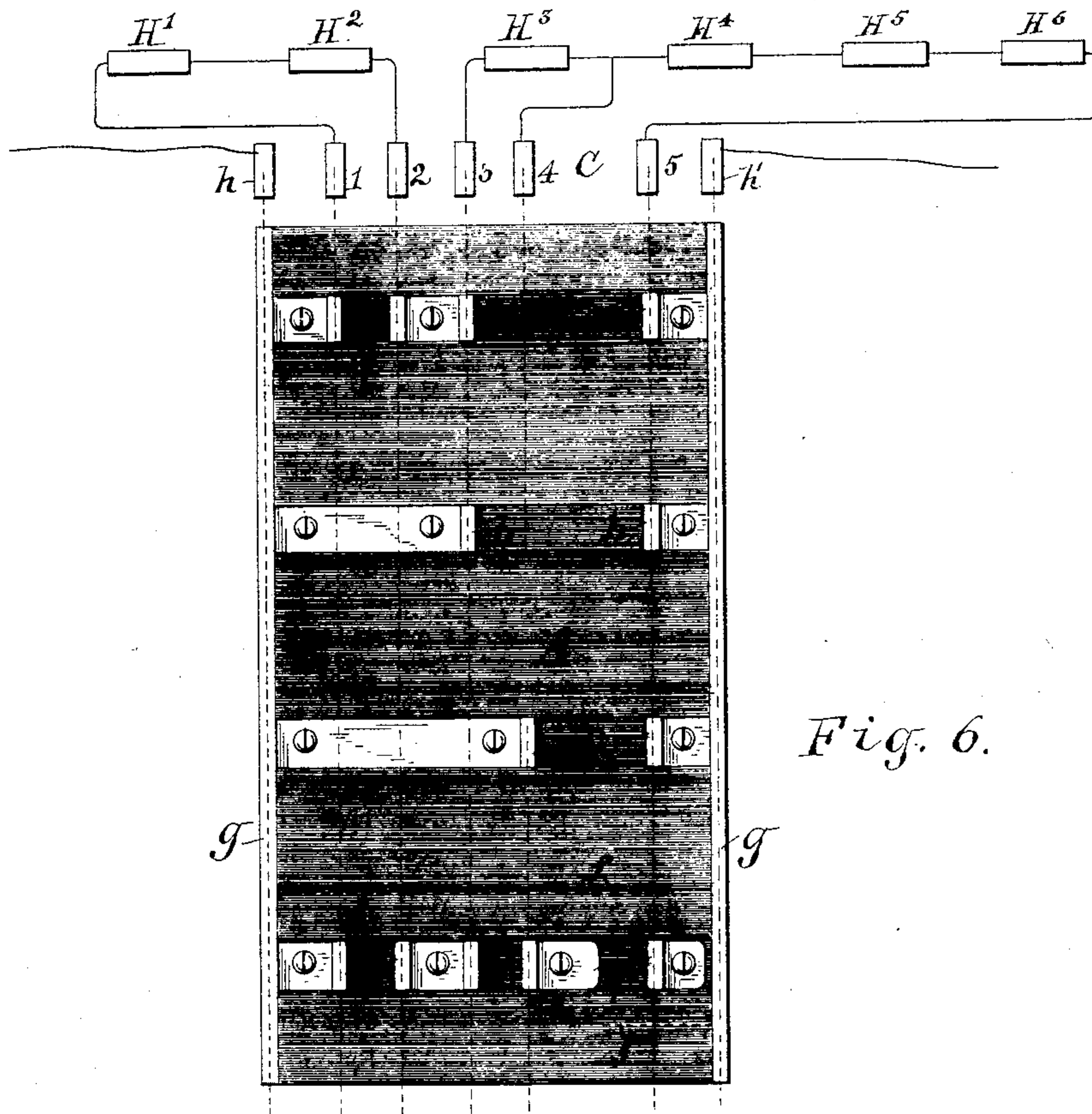


Fig. 6.

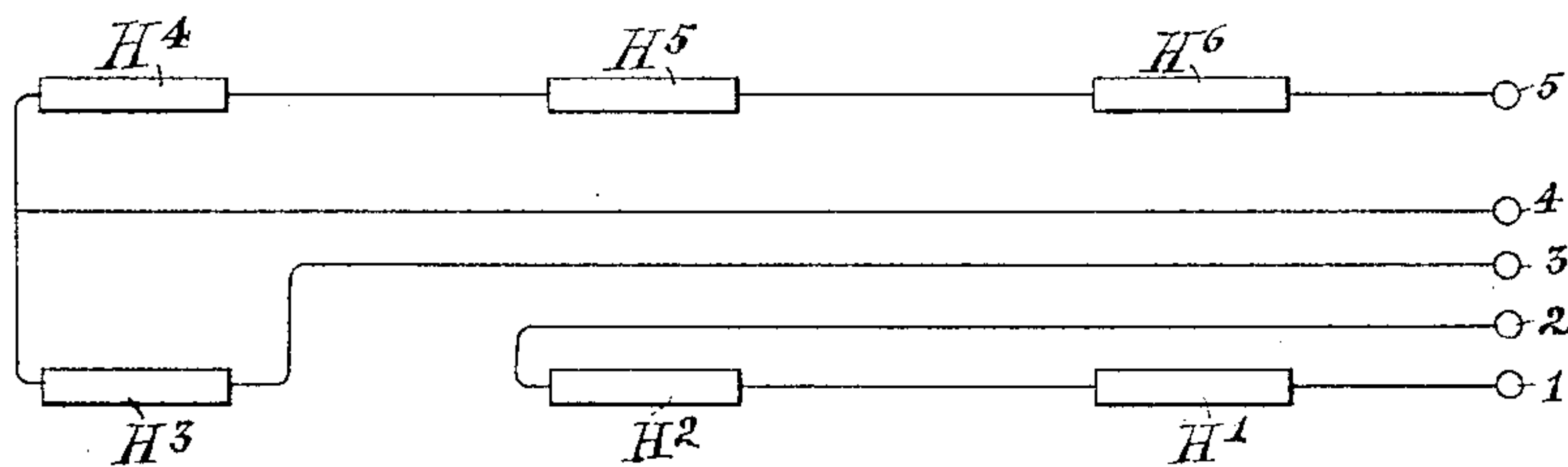


Fig. 7.

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# UNITED STATES PATENT OFFICE.

MARK W. DEWEY, OF SYRACUSE, NEW YORK.

## ELECTRIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 535,533, dated March 12, 1895.

Application filed January 11, 1895. Serial No. 534,509. (No model.)

*To all whom it may concern:*

Be it known that I, MARK W. DEWEY, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Electric Switches, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in that class of devices known as electric switches by which the electric current is guided through various channels or circuits, and the object is to simplify such devices, which are more or less complicated and expensive, and adapt them for commercial use.

To this end my invention consists in the combination of a cylinder of insulating material, strips of metal secured in longitudinal rows across said cylinder and projecting beyond the surface thereof, a longitudinally movable bar within the cylinder connected to the latter by a spline and groove, a circuit maker and breaker operated by said bar and connected to the latter, an indicator arm carried by the said bar, a locking device on the arm, means to operate the bar, and a series of contacts adapted to engage the said strips; and my invention consists in certain other combinations of parts hereinafter described and specifically set forth in the claims.

In the drawings hereto annexed and forming a part of this specification, Figure 1 is a side elevation partly in section of the interior parts of my invention when said parts are moved to make the circuit. Fig. 2 is a view similar to Fig. 1 showing the parts moved to break the circuit. Fig. 3 is an end view of the switch. Fig. 4 is a cross-sectional view of the cylinder taken on line *xx* of Fig. 2. Fig. 5 is a sectional view of a modified form of cylinder. Fig. 6 is a detail view of the entire surface of the cylinder as it would appear if changed to a flat surface, and Fig. 7 is a diagram of the circuits when six electric heaters placed on a car are connected with the switch.

Referring specifically to the drawings, A is a cylinder formed of insulating material as hard rubber or fiber.

*a, b, c* and *d* are rows of electric contacts mounted upon and carried by the cylinder. These contacts are preferably formed of strips

of metal of different lengths bent so that their ends project outwardly or radiate from and beyond the surface of the cylinder. The strips are secured to the cylinder by screws and preferably lie in longitudinal grooves equal distances apart in the surface of the cylinder, as shown in the drawings. The ends of the strips forming the contacts are arranged to engage a row of stationary contacts, C, mounted upon but insulated from the case, B, of the switch, the stationary contacts being connected to the different circuits through which the electric current is to pass.

Within the cylinder, A, and connected to the same by a spline and groove, *a'*, is a round bar, A', which is rotated when it is desired to rotate the cylinder. The said bar is also capable of longitudinal movement and is mounted to slide in the front end of the case, B, and a support, B', mounted on the base within the case. The bar is operated by means of a handle in the shape of a small wheel, D, on the end of the bar projecting from the case. Keyed to the bar between the said wheel and the case is an arm, E, provided with a pointer *e*. The pointer indicates the position of the cylinder within the case. When it is turned to point to any one of the Figures 1, 2, 3 or 4 on the end of the case, shown in Fig. 3, it is known that the first, second, third or fourth row of the contacts on the cylinder, as the case may be, is in position or connection with the row of stationary contacts, C, mounted on the case. When the indicating arm is moved to any one of these positions after it is drawn out from the end of the case, it may be moved toward the case, but at no other time. This is owing to a pin, *e'*, or projection carried by the arm and extending toward the case, and holes, *e''*, in the end of the case to receive the pin in such a position that the pin can enter only when the pointer on the arm extends toward a figure or mark.

The opposite or inner end of the bar, A', is connected to a knife switch, F, mounted on the inner side of the rear end of the case, B, so that when the bar is forced into the case the switch is closed and when it is drawn out it is open. This switch may be either a single or a double pole switch, as desired.

It will be apparent that the cylinder cannot be turned except when the knife switch is



open on account of the pin and holes, so that there will be no possibility of sparking between the contacts carried by the cylinder and the stationary contacts and therefore no injury can be done to either. Said knife switch is connected to the bar, A', by a link, A'', extending from the switch to a loose collar, A''', secured upon the end of the bar by a nut a''.

The base, F', of the knife switch should be made of suitable insulating material.

In Figs. 1, 2 and 4 of the drawings, the stationary contacts are shown formed double, so that the projecting ends of the strips, a, b, c and d will pass between them and make perfect contact, but in Fig. 5 I show a common flat contact finger bearing with its free end upon a strip. In this same figure the grooves for the several rows of metal strips are shown formed by securing segments of insulating material upon the cylinder between the strips. These segments are secured in place by screws, but suitable cement may be used for the purpose and also for the purpose of securing the metal strips in position which, in this case, are set on edge and are not bent.

The stationary contacts are separated from each other and mounted upon a block of insulating material, C', so that they are insulated from each other.

Referring now more particularly to Fig. 6 of the drawings, it will be readily seen that when the cylinder, A, is turned so that the rows of contacts, a, engage the stationary contacts, C, Nos. 1, 2, 3 and 5 are engaged, which connects the six heaters, or other translating devices, H', H<sup>2</sup>, H<sup>3</sup>, H<sup>4</sup>, H<sup>5</sup> H<sup>6</sup> in series. When the row, b, of movable contacts engages the stationary contacts, Nos. 3 and 5 are engaged, which connects H<sup>3</sup>, H<sup>4</sup>, H<sup>5</sup> and H<sup>6</sup> in series. When C engages the stationary row, Nos. 4 and 5 are engaged, which connects H<sup>4</sup>, H<sup>5</sup> and H<sup>6</sup> in series; and when row, d, engages the stationary row, Nos. 1, 2, 3, 4 and 5 are engaged, which connects the six translating devices in two groups of three each, H', H<sup>2</sup> and H<sup>3</sup> being in one group and H<sup>4</sup>, H<sup>5</sup> and H<sup>6</sup> being in the second group. Therefore if heaters were connected to this switch, four different degrees of heat may be had, depending upon the position of the switching apparatus. In order to make the last connection with the row, d, additional connections, f, f', are provided between the strips and the disks, g, g, on the ends of the cylinder A. These connections are passed through conduits, j, j, in the insulations, as shown in Fig. 4.

The spring contacts, h, and h', bearing upon the disks g, g, are mounted upon blocks of insulating material, i, i, on the inside of the case.

I do not desire to be limited to the number of rows of movable contacts on the cylinder, nor to their location, neither do I desire to be limited to the number of heaters or other translating devices used therewith as it is ob-

vious that the number may be greatly varied without departing from my invention.

The cylinder, A, may be rotated in either and both directions, and, if desired, the link, A'', or the loose collar, A''', may be made of insulating material in order to thoroughly insulate the switch, F, from the bar, A', or handle D.

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

1. In an electric switching apparatus, the combination of a cylinder of insulating material, strips of metal secured in longitudinal rows across said cylinder and projecting beyond the surface thereof, a longitudinally movable bar within the cylinder connected to the latter by a spline and groove, a circuit maker and breaker operated by said bar and connected to the latter, an indicator arm carried by the same bar, a locking device on the arm, means to operate the bar, and a series of contacts adapted to engage said strips, as and for the purpose described.

2. In an electric switching apparatus, the combination of a cylinder, strips of metal secured in rows across said cylinder and insulated from each other, a bar within said cylinder adapted to be reciprocated therein and to rotate with the cylinder, a circuit maker and breaker connected to said bar and adapted to be operated by the latter when said bar is moved longitudinally, an arm mounted upon and secured to the bar, means carried by said arm by which it may be locked in several positions, and a row of stationary contacts adapted to engage said strips, substantially as and for the purpose described.

3. In an electric switching apparatus, the combination of a cylinder of insulating material, strips of metal secured in longitudinal rows across said cylinder and projecting beyond the surface thereof, a longitudinally movable bar within the cylinder connected to the latter by a spline and groove, a knife switch connected to one end of the said bar, an indicator carried by the same bar and rigidly secured to the same, a handle on one end of the bar to operate the same, and a series of contacts arranged in a row and adapted to engage the said strips successively as and for the purpose described.

4. In an electric switching apparatus, the combination with the casing, of a cylinder of insulating material, strips of metal secured in longitudinal rows across said cylinder and projecting beyond the surface thereof, a longitudinally movable bar within the cylinder and extending through one side of the case, a spline and groove connecting the cylinder with the bar, a circuit maker and breaker mounted upon the inner side of one end of the case and connected to the end of the bar, an indicator arm keyed to the bar outside of the case, a pin carried by the free end of the arm, apertures in the case to receive the pin, a handle on the



outer end of the bar to operate the same, and a series of stationary contacts arranged in a row, insulated from each other and mounted upon the inner side of the case, as and for the purpose set forth.

5 5. In an electric switching apparatus, the combination with the casing, of a grooved cylinder of insulating material, strips of metal secured to said cylinder and lying in the  
10 grooves thereof, a longitudinally movable bar within the cylinder and extending through the side of the case, a spline and groove connecting the cylinder with the bar, a knife switch mounted upon the inner side of one  
15 end of the case, a loose collar on the end of the bar, a link between the collar and the switch, an indicator arm keyed to the bar outside of the case, a pin carried by the free end of the arm, apertures in the case to receive  
20 the pin, a handle on the outer end of the bar to operate the same, and a series of stationary contacts arranged in a row, insulated from each other and mounted upon the inner side of the case, as and for the purpose set forth.

25 6. In an electric switching apparatus, the combination with the case, of a cylinder of insulating material, strips of metal secured in

longitudinal rows across said cylinder and projecting beyond the surface thereof, a longitudinally movable bar within the cylinder 30 and extending through one side of the case, a spline and groove connecting the cylinder with the bar, a circuit maker and breaker mounted upon the inner side of one end of the case and connected to the end of the bar, 35 a metal disk on each end of the cylinder, electric contacts insulated from the case and bearing upon said disks, electric connections leading to said contacts, an indicator arm keyed to the bar outside of the case, a pin carried by 40 the free end of the arm, apertures in the case to receive the pin, a handle on the outer end of the bar to operate the same, and a series of stationary contacts arranged in a row, insulated from each other and mounted upon the 45 inner side of the case, as and for the purpose set forth.

In testimony whereof I have hereunto signed my name.

MARK W. DEWEY. [L. S.]

Witnesses:

H. M. SEAMANS,  
R. S. DEWEY.