

(No Model.)

E. R. KNOWLES.
ELECTRICAL INDICATOR.

No. 408,018.

Patented July 30, 1889.

Fig. 1.

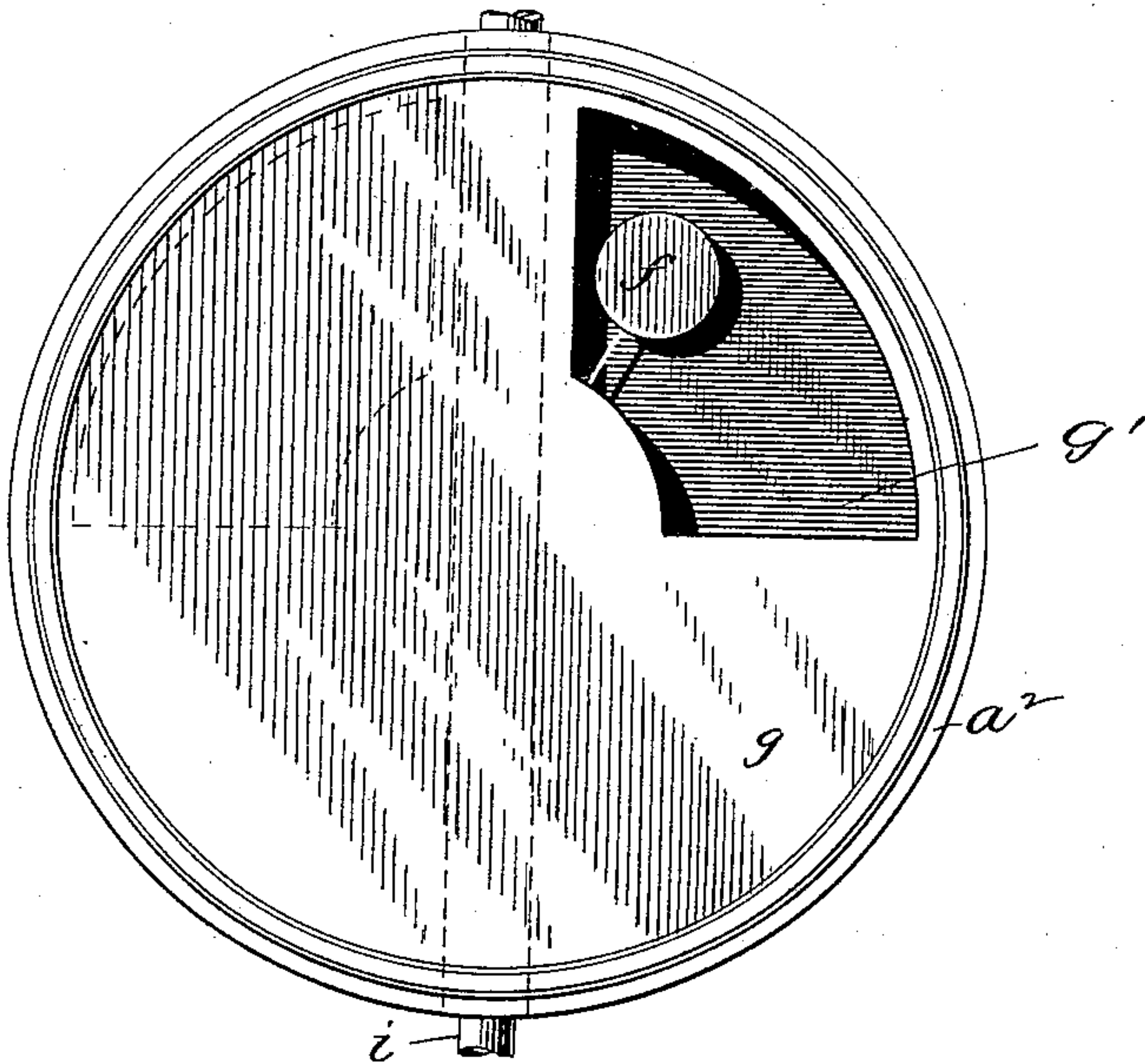


Fig. 2.

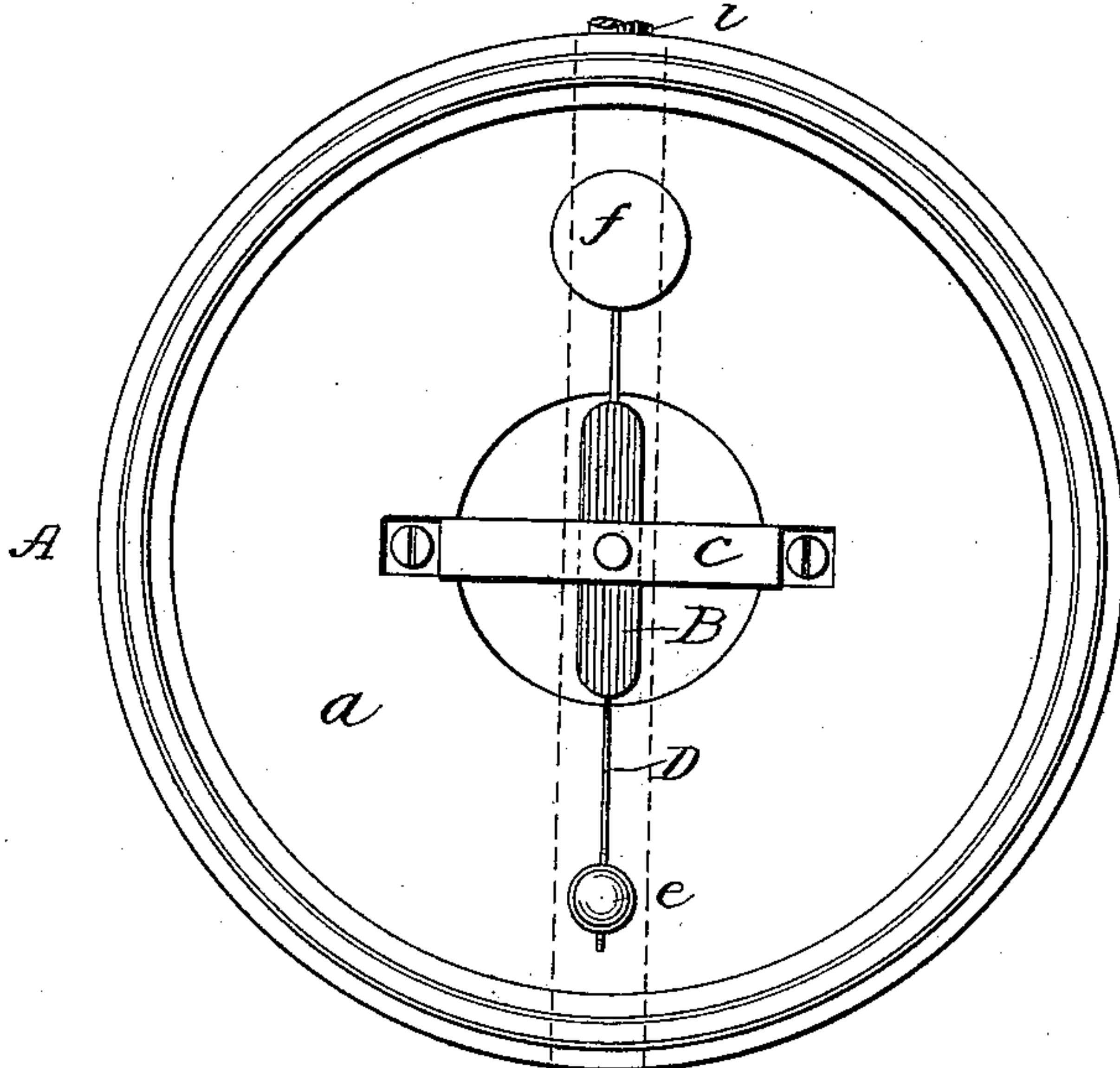
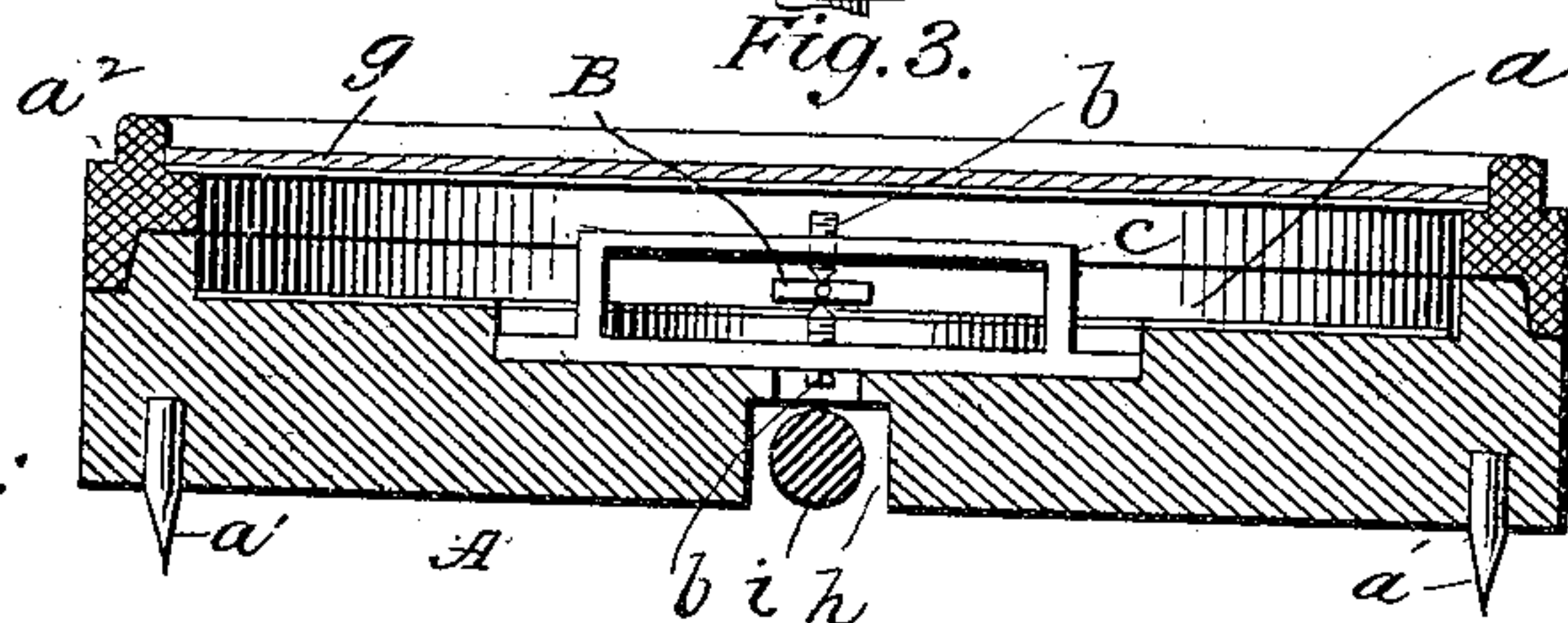


Fig. 3.



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ELECTRICAL INDICATOR.

SPECIFICATION forming part of Letters Patent No. 408,018, dated July 30, 1889.

Application filed March 5, 1889. Serial No. 301,857. (No model.)

To all whom it may concern:

Be it known that I, EDWARD R. KNOWLES, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electrical Indicators, of which the following is a specification.

The invention pertains to electrical indicators for indicating the direction in which a current is flowing through a given conductor.

The principle involved is old; but the invention consists in the details of construction of the apparatus, which render it convenient and efficient.

Referring to the drawings, Figure 1 represents a face view of the instrument; Fig. 2, a similar view with the glass face removed, and Fig. 3, a central section.

A represents a base or support of insulating material, preferably wood. It is circular in shape and has a circular recess or opening a in its face, in which the moving element rotates. The base may be fitted with brads a' , which are forced into a wooden support in order to secure the device in position. The instrument is provided with a cover a^2 , which may be placed in position, removed, or rotated on its seat at pleasure.

B represents a magnetic bar or needle free to turn on delicately-formed pivots $b b$. The pivots consist of pointed adjustable screws, which are supported in a frame c , the frame being secured in a notch in the base-piece, as shown. Attached to the magnetic bar B in any suitable manner is a needle or pointer D, preferably made of aluminium or some other light and strong material. This needle extends across the diameter of the opening or recess in the base and, together with the magnetic bar, constitutes the moving element of the instrument.

The instrument is designed to be placed vertically against a wall or other support, and the needle D will be weighted at its lower end by a shot or light piece of metal e , which shall be adjustable in its position for the purpose of giving the needle the tendency to maintain a vertical position. The opposite end of the needle carries a disk of paper or other light substance f . This disk may be colored to ren-

der it easily discernible. The back or bottom of the recess or opening in the base-piece will be covered with a disk of white paper, or may be painted white, in order that the contrast between it and the colored disk on the needle may be great.

A glass front g is inserted in the cover a^2 and rests upon a shoulder formed thereon in the usual manner. This glass will be opaque in about three-quarters of its area, one-quarter g' being left transparent. This effect may be produced by placing a disk of paper with one-quarter removed on the under side of the glass in a position shown in Fig. 1, or the under side of the glass may be painted.

A slot h is cut diametrically and vertically across the back of the base-piece for the purpose of accommodating the conductor, (represented in this case by i), in which the current whose direction is to be indicated flows.

When no current is flowing in the conductor, it is obvious that the magnetic bar or needle will stand in a vertical position; but the moment a current flows in the conductor the magnetic bar or needle will be deflected to one side or the other in accordance with the direction in which the current flows. The cover of the instrument carrying the glass face should be placed in such a position that when the current in the conductor is flowing in its normal and proper direction the disk on the needle will be deflected and exposed through the transparent portion of the glass; but when no current is flowing, or when it is flowing in the wrong direction, the disk will not be seen, but will be either standing vertically or deflected to the other side. When an observer notices that the disk is in sight, he is sure that the current is flowing, and is flowing in the proper direction. If he does not see the disk, he is aware that there is no current flowing, or, if it is, that it is flowing in the wrong direction, and he immediately takes action accordingly. If the normal direction of the flow of the current in the conductor is the reverse of that indicated by the disk standing to the right, the glass face and cover of the instrument may be rotated in its seat, so that the transparent portion of the glass shall be located on the opposite side of

the conductor in the position shown in dotted lines in Fig. 1. The same service will then be performed by the instrument.

Having described my invention, I claim—

- 5 1. The combination, with a base-piece or frame A, provided with a slot to receive the conductor in which the operating-current flows, of a magnetic needle mounted on pivots in said base-piece or frame.
- 10 2. In a current-indicator, the combination, with a casing provided with a slot passing vertically through its center for the accommo-

dation of an electric conductor, of a needle or pointer pivoted centrally therein and adapted to swing in a vertical plane and a weight at- 15 tached to one end of said needle tending to maintain it in a vertical position.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

EDWARD R. KNOWLES.

Witnesses:

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