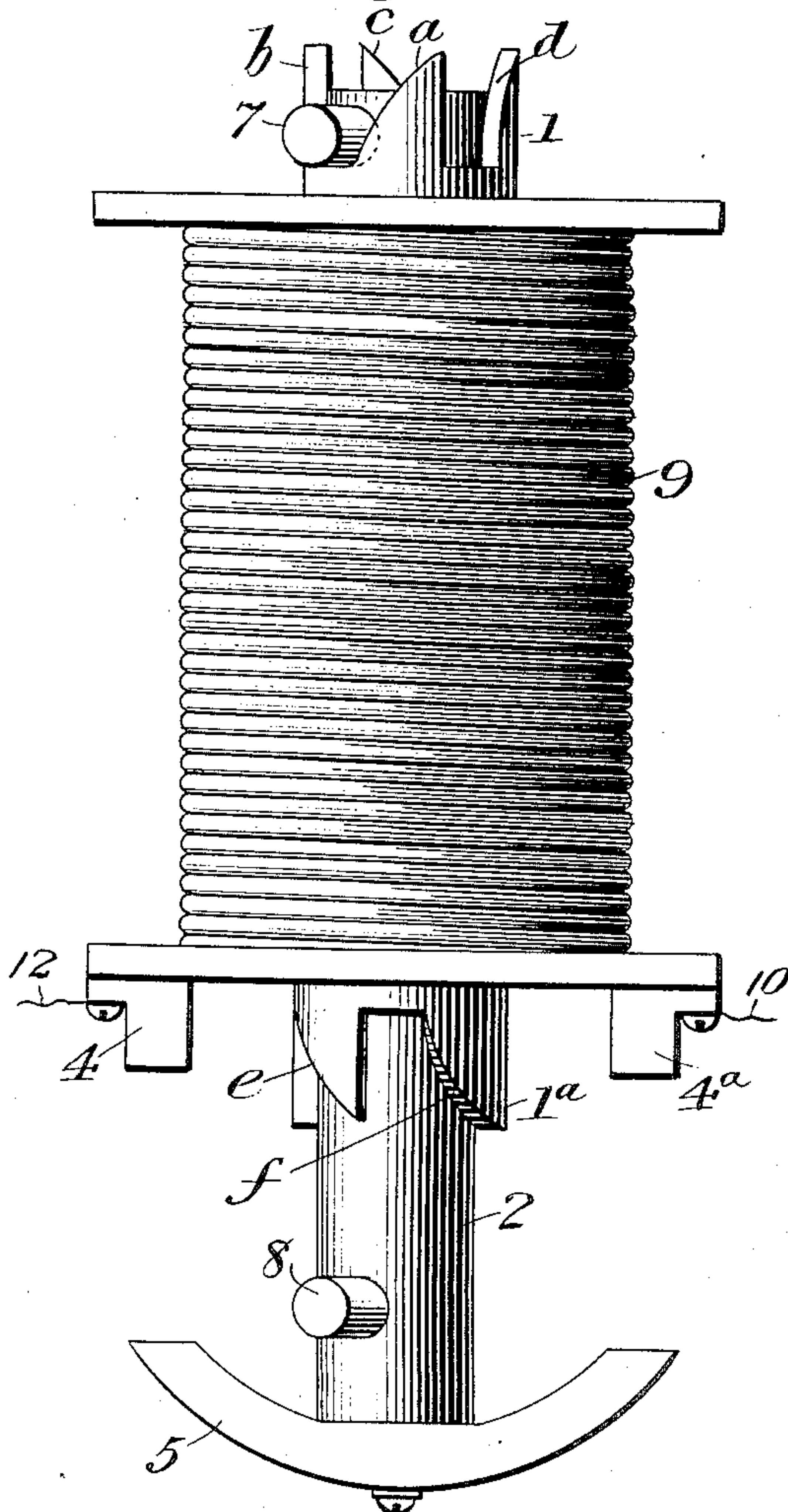


F. T. KITT.

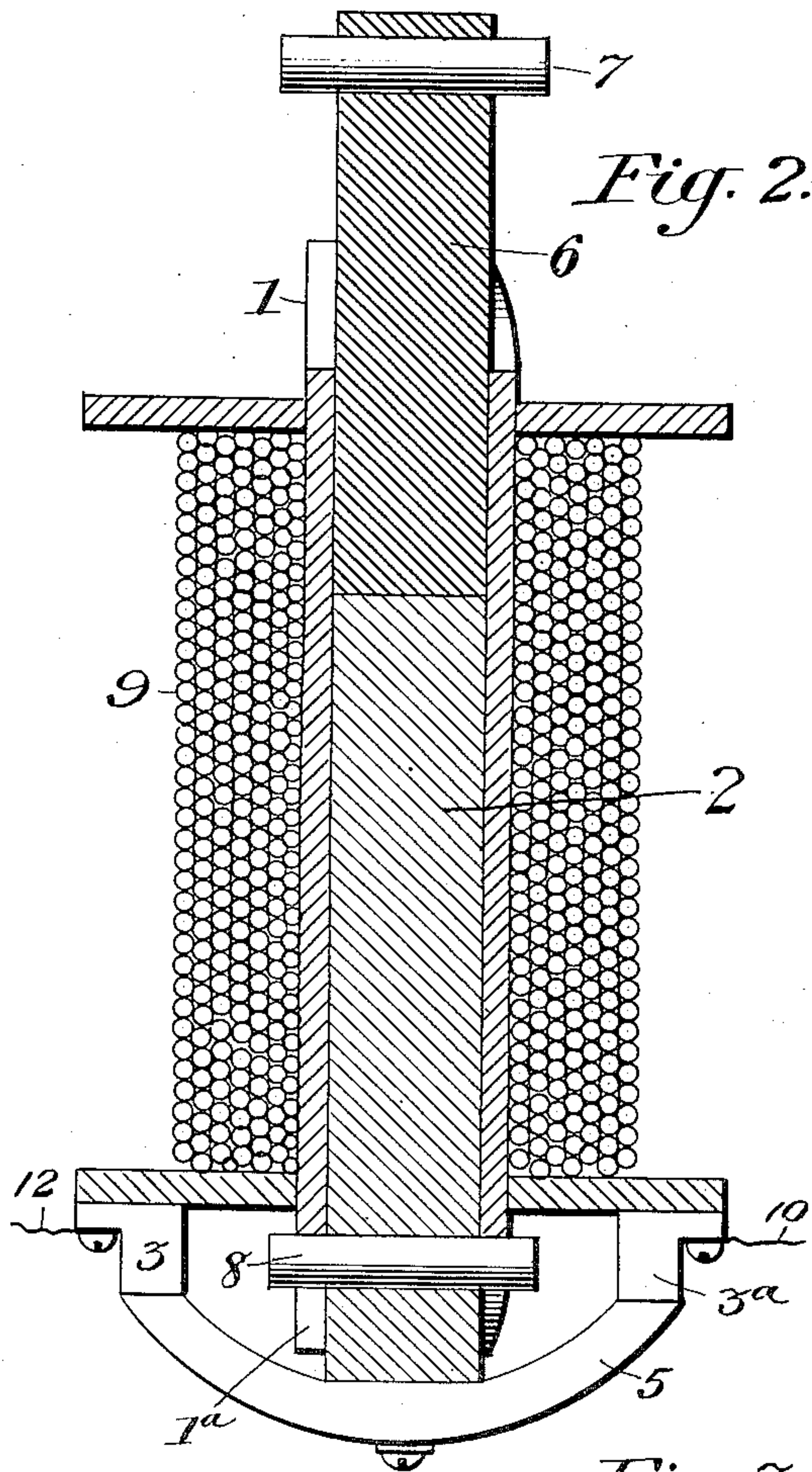
AUTOMATIC ELECTRIC CIRCUIT CHANGER OR SWITCH.

APPLICATION FILED FEB. 15, 1904.

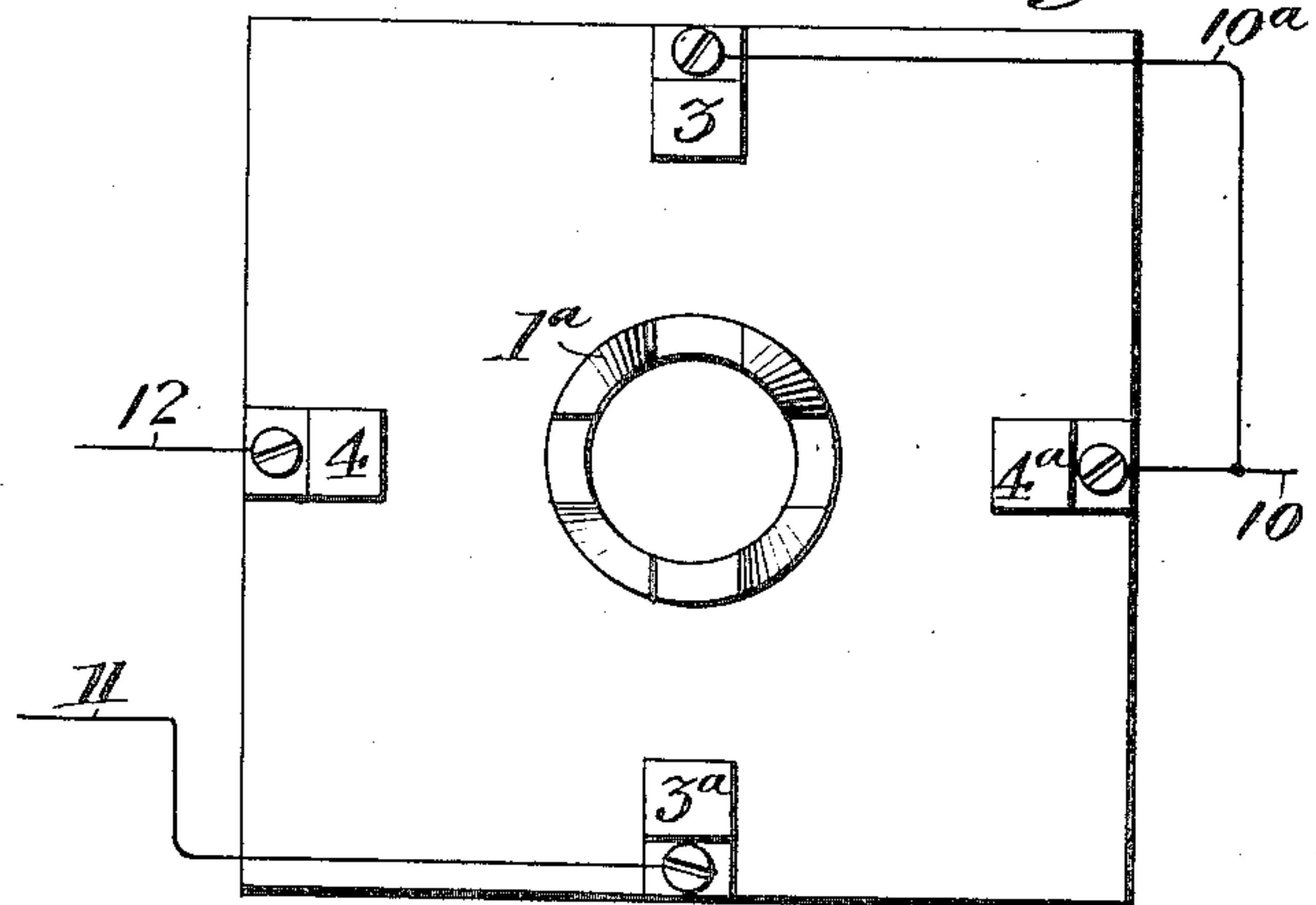
*Fig. 1.*



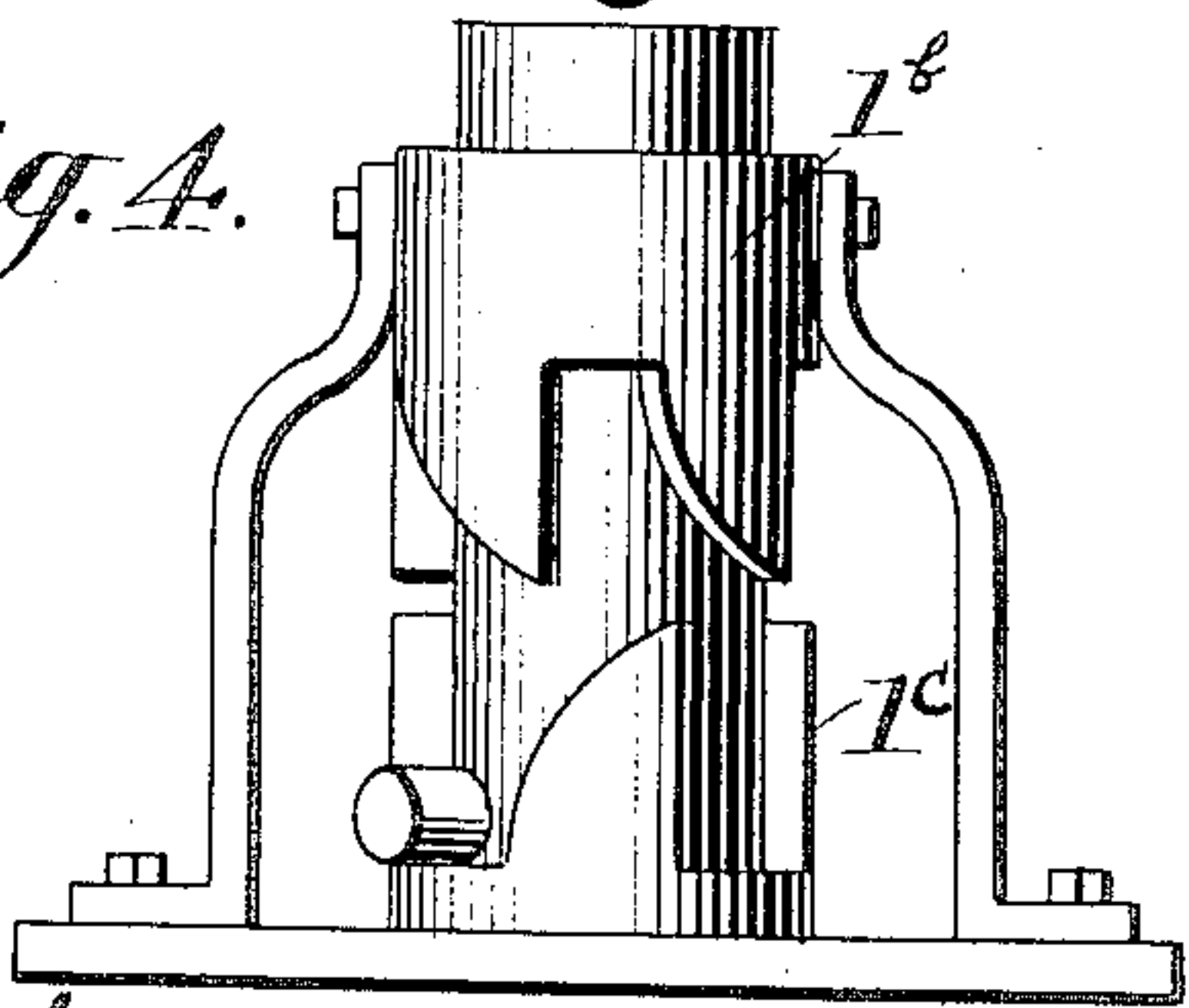
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



Witnesses:

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*Otto A. Krupp.*

Inventor:

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# UNITED STATES PATENT OFFICE.

FREDERICK T. KITT, OF DENVER, COLORADO.

## AUTOMATIC ELECTRIC CIRCUIT CHANGER OR SWITCH.

No. 820,119.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed February 15, 1904. Serial No. 193,645.

*To all whom it may concern:*

Be it known that I, FREDERICK T. KITT, a citizen of the United States of America, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in an Automatic Electric Circuit Changer or Switch; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to improvements in an automatic electric circuit changer or switch, my object being to provide means whereby a current of electricity can be made to take different paths or distinct circuits may be alternately opened and closed, as may be desired.

In carrying out my invention I employ a solenoid having a vertically-disposed plunger the lower part of which is made of magnetic material, preferably soft iron, the upper part of non-magnetic material, preferably brass, so arranged that when a current of electricity is sent through the coil the magnetic part will be drawn into said coil by magnetic induction, which will force the non-magnetic part out at the opposite end of the solenoid. Said plunger is provided with a cross-arm of conducting material at the lower end and arranged so that when the plunger is in the upper position or drawn into the coil the cross-arm or bridge-piece will bridge across or connect together electrically a certain pair of contact-blocks, several pairs of which are secured to a piece of insulating material just below and which forms the lower end piece of the solenoid-coil. It is also provided with pins or projections at each end, which are arranged to engage stationary parts on each end of said coil. The lower pin or projection engages the stationary part on the lower end of the coil when the coil is being energized and the plunger being drawn up into said coil, the pin or projection on the upper end coming into engagement with the stationary parts on the upper end of said coil when the current through said coil is broken and the plunger is drawn down by gravity. By the peculiar construction of said stationary parts and the arrangement of said pins or projections the plunger is turned a part of a revolution while it is being drawn up and another part while it is falling. Thus each time the plunger is brought to the upper position the bridge-piece is in a different position. The

contact-blocks being properly arranged, the bridge-piece will bridge a different pair each time.

Having briefly outlined my improved construction, I will now proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a view showing the appliances complete as constructed for handling two circuits only, with the exception that only one pair of contact-blocks is shown, it being impossible to show the other pair, as it would obstruct the view of an important part. Fig. 2 is a sectional view of same; Fig. 3, a view of the lower end of the solenoid-coil, showing method of securing the contact-blocks thereto, also an end view of the lower stationary part 1<sup>a</sup>. Fig. 4 is a view showing how both the stationary parts may be mounted on one end of the coil so that only one pin through the plunger is necessary.

Let the numeral 9 indicate the solenoid-coil proper; 3 3<sup>a</sup> 4 4<sup>a</sup>, the contact-blocks; 5, the bridge-piece; 6, the non-magnetic, and 2 the magnetic part of the plunger; 7, the upper, and 8 the lower pins through the plunger; 10, a wire composing a part of a circuit; 10<sup>a</sup>, a branch wire connecting together block 3 and 4<sup>a</sup>; 11 12, parts of two distinct circuits which are closed by the bridge-piece bridging across 3 3<sup>a</sup> or 4 4<sup>a</sup>, respectively.

The operation of the device will be better understood if we assume that the coil, Fig. 1, be energized. The plunger 2 will be drawn up so that the pin 8 will come in contact with the part 1<sup>a</sup> and by means of the inclined face *e* will be turned a part of a revolution, so that the bridge-piece will come in contact with the blocks 3 3<sup>a</sup>, Fig. 3. On the coil being deenergized the plunger will fall by gravity, the pin 7 will come in contact with inclined face *b* on part 1 while the plunger is falling, thus turning the plunger a part of a revolution and far enough so that on the coil being again energized the pin 8 will engage an inclined face 1 to the right of the one engaged before and cause the bridge-piece to connect the blocks 4 4<sup>a</sup>. These pins go through the plunger and extend an equal length on each side. Each end of the pin comes in contact with an inclined face, said inclined faces being cut in pairs, one each side of the parts 11<sup>a</sup>, as *a c* and *b d* on part 1, Fig. 1. The part 1<sup>a</sup> also has inclined faces on its opposite side corre-



sponding to faces *e f*. It can be seen that if the pins only extended on one side of the plunger the same result would be accomplished, it being extended on both sides only for convenience and to divide the wear and tear on the pins. It is also noted that pin 7 limits the downward and pin 8 the upward movement of the plunger. It is evident that parts 1 1<sup>a</sup> may be arranged in different positions than hereshown. For instance, 1<sup>a</sup> may be placed directly above the part 1 at the proper distance from each other and with their points properly arranged so that only one pin is necessary, it engaging the upper stationary part on the upward movement and the lower one on the downward movement, or they may both be placed at the bottom in a similar manner, as shown in Fig. 4, part 1<sup>b</sup> corresponding to part 1<sup>a</sup>, Figs. 1 and 2, and part 1<sup>c</sup> to part 1, Figs. 1 and 2. The inclined faces may also be made in slightly different ways. The design shown in Fig. 1, however, seems to be the most simple and practical construction.

Having thus described my invention, what I claim is as follows:

1. In an electromagnetic switch, a solenoid, a sliding core therefor, a contact fastened

to said core, stationary contacts, a lug projecting from said core, a stationary cam with angular surfaces cooperating with said lug, so combined that upon the energization of the solenoid with the consequent movement of the core the movable contact is given a partial rotary movement to engage a stationary contact.

2. In an electromagnetic switch, a solenoid a sliding core therefor, a contact fastened to said core, stationary contacts, lugs projecting from said core, angularly-disposed stationary cams with angular surfaces, each cam cooperating with one of said lugs, so combined that upon the energization of said solenoid the core and movable contact are partially rotated because of the engagement of one lug with one of the said cams, and upon the deenergization of said solenoid the core and movable contact are given a further partial rotation because of the engagement of another of said lugs with its cooperating cam.

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