

No. 812,657.

PATENTED FEB. 13, 1906.

I. KITSEE.
ELECTRIC COIL.
APPLICATION FILED SEPT. 10, 1904.

Fig. 1.

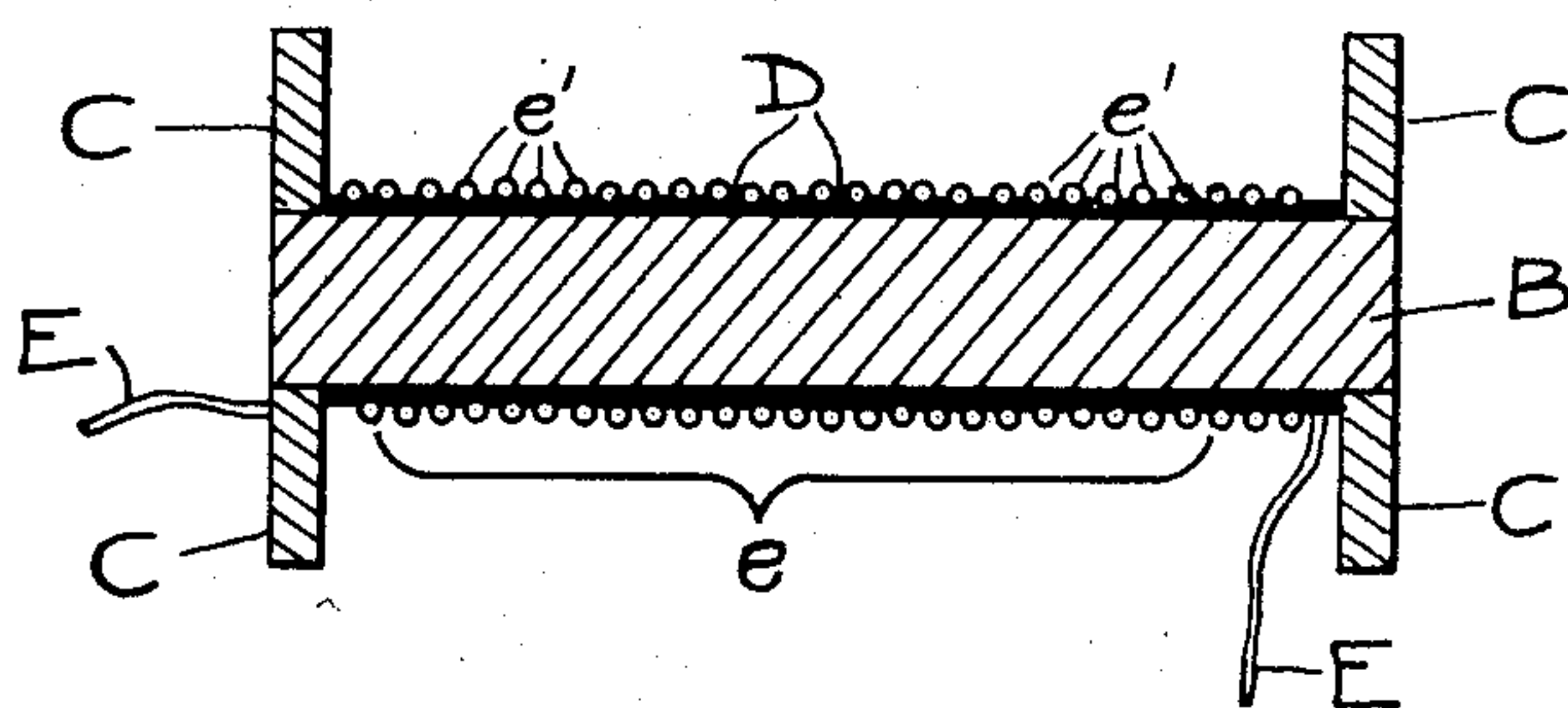


Fig. 2.

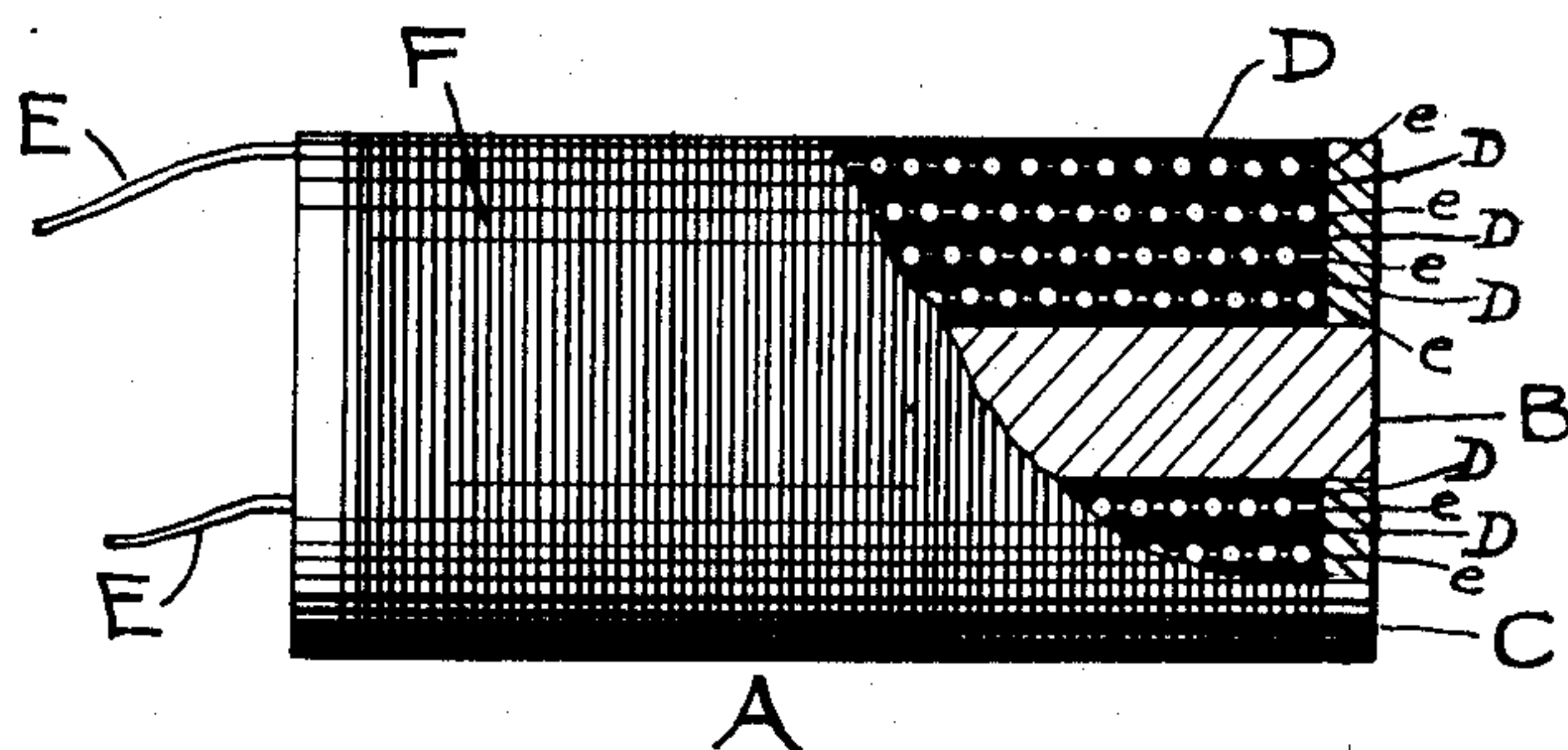
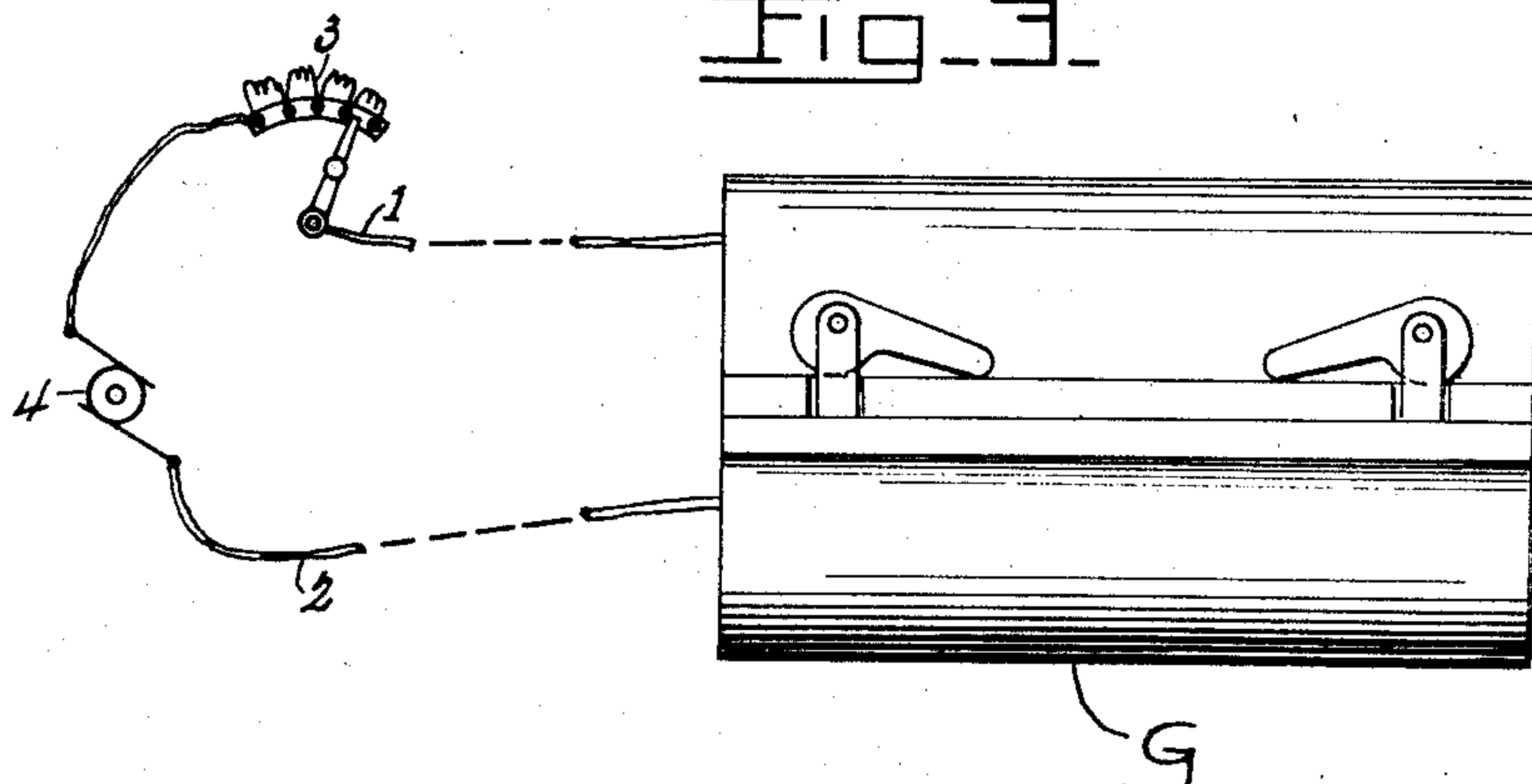


Fig. 3.



Witnesses
A. N. Cramer.
Edith P. Stille.

Inventor
I. Kitsee.

UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRIC COIL.

No. 812,657.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed September 10, 1904. Serial No. 224,002.

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Electric Coils, of which the following is a specification.

My invention relates to an improvement in electric coils.

In the manufacture of electric coils it is of great importance that the different convolutions of the different layers should always retain their original position and should not be displaced by handling. It is also of great importance to have the different convolutions, as well as the different layers, carefully insulated from each other and to bring the separate convolutions as near together as possible without reducing the value of their insulation. To produce a coil possessing these properties in a cheap and efficient manner is the aim of my invention.

It is well known to persons versed in the art that the greatest expense in the manufacture of coils is incurred in the insulation of the wire proper, and for that reason I make use of a perfectly bare or uninsulated wire wound in a manner so that a slight space remains between the different convolutions. Means for this purpose are well known. I am aware that to-day bare wires are used in connection with a fibrous thread for the purpose of insulating one convolution from the other; but these coils are not effective, for the reason that the different convolutions and layers are easily disturbed and displaced, whereby the whole function of the coil is destroyed, and my invention obviates this difficulty.

Referring to the drawings, Figure 1 is a longitudinal sectional view of a coil partially finished. Fig. 2 is a partial plan and partial cross-section showing a finished coil. Fig. 3 is a side elevation of the compressing-mold inclosing the coil with an electric heating device in diagram.

A is the coil proper, preferably embracing, as illustrated, the core B, the end pieces C, the non-conducting layers D D D D, and the layers of wire e e e e, each layer embracing a series of convolutions e', the wire itself being designated by the letter E.

F is the outer covering for the coil proper when finished.

In Fig. 3, G represents the compressing-mold. This figure also includes the electric

heating device, embracing the wires 1 and 2, the rheostat 3, and the source of current 4.

The *modus operandi* of practicing this my invention is as follows: The core or frame B of the coil is surrounded by a layer of yielding non-conducting material, preferably an unvulcanized soft rubber provided with the necessary sulfur or compound of same, so that with the aid of heat or heat and pressure the same may later be vulcanized to the required degree. Around this first non-conducting layer is wound the first layer of bare wire in a manner so that the different convolutions should be out of touch with each other. It is preferred that the winding of the wire on the first non-conducting and yielding support should be such that the wire proper is partially embedded in this support. When the first layer of wire is finished, a second layer of yielding and non-conducting material, preferably, as said above, of unvulcanized soft rubber, is placed around this first layer of wire, and these steps are repeated and continued till the necessary layers of wires are produced, each layer of wire separated from the next following by a layer of the non-conducting and yielding material. After the whole coil is finished the same is, if the non-conducting material is unvulcanized rubber, inclosed in a compressing device and then subjected to a high temperature, whereby the unvulcanized rubber is, with the aid of the sulfur contained therein, vulcanized in a manner well known to persons versed in the art.

I have shown in Fig. 3 the mode of vulcanization with the aid of an electric current passing through the wires of the coil, thereby raising the temperature of these wires to the required degree. It is well understood that if two surfaces of soft and unvulcanized rubber are subjected to heat and pressure in the presence of sulfur they will vulcanize in a manner so as to form one mechanical unit, and if a coil constructed in the manner as shown and described is subjected to heat and pressure for the purpose of vulcanization it is evident that the different layers of the unvulcanized rubber will form a unit on these surfaces, which in Fig. 2 are only separated by a slight space, and the wire proper will then in reality be embedded in one block of solid insulating material, and displacing of the different convolutions of wire is therefore entirely out of the question. It is obvi-

ous that the vulcanizing can be carried on to a degree so as to produce one mechanical mass of what is commonly known in commerce as "hard rubber."

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

1. The method of forming a coil useful for electric purposes which consists in forming
10 out of uninsulated or bare wire a series of layers, each consisting of a series of convolutions, spacing the convolutions in a manner so as to prevent contact between the same, and insulating the different layers from each
15 other through the interposition of layers of unvulcanized rubber or caoutchouc provided with the necessary vulcanizing material and then uniting the different layers through the process of vulcanization.

20 2. In the manufacture of coils useful for electric purposes, the process which consists in separating the different layers of wire, as they are produced, by layers of unvulcanized rubber containing its vulcanizing material,
25 and then subjecting said layers of rubber and wire to the process of vulcanization, thereby uniting the rubber and embedding therein the wire.

3. In the manufacture of electric coils
30 wherein bare wire is employed to form said coil, the following steps, to wit: first, provid-

ing a support out of a layer of unvulcanized rubber; second, winding thereon uninsulated wire so as to produce a layer, the individual convolutions of which are separated by a
35 space; third, covering said layer of wire with a layer of unvulcanized rubber, and multiplying said steps so as to produce a coil of required size, and finally subjecting the whole to a vulcanizing process whereby the different
40 layers of unvulcanized rubber are united and form a substantial covering for the bare wire and whereby the former soft and unvulcanized rubber is converted into a hard rubber.

4. As a new article of manufacture, a block
45 of vulcanized rubber provided with a series of spiral-like channels and a series of layers of metallic wires, each consisting of a series of convolutions incased in said channels.

5. As a new article of manufacture, a block
50 of hard rubber having incased therein a series of layers of wire, each consisting of a series of convolutions, the layers and convolutions insulated from each other by parts of
55 said hard rubber.

In testimony whereof I hereby sign my name, in the presence of two subscribing witnesses, this 9th day of September, A. D. 1904.
ISIDOR KITSEE.

Witnesses:

EDITH R. STILLEY,
H. C. YETTER.