

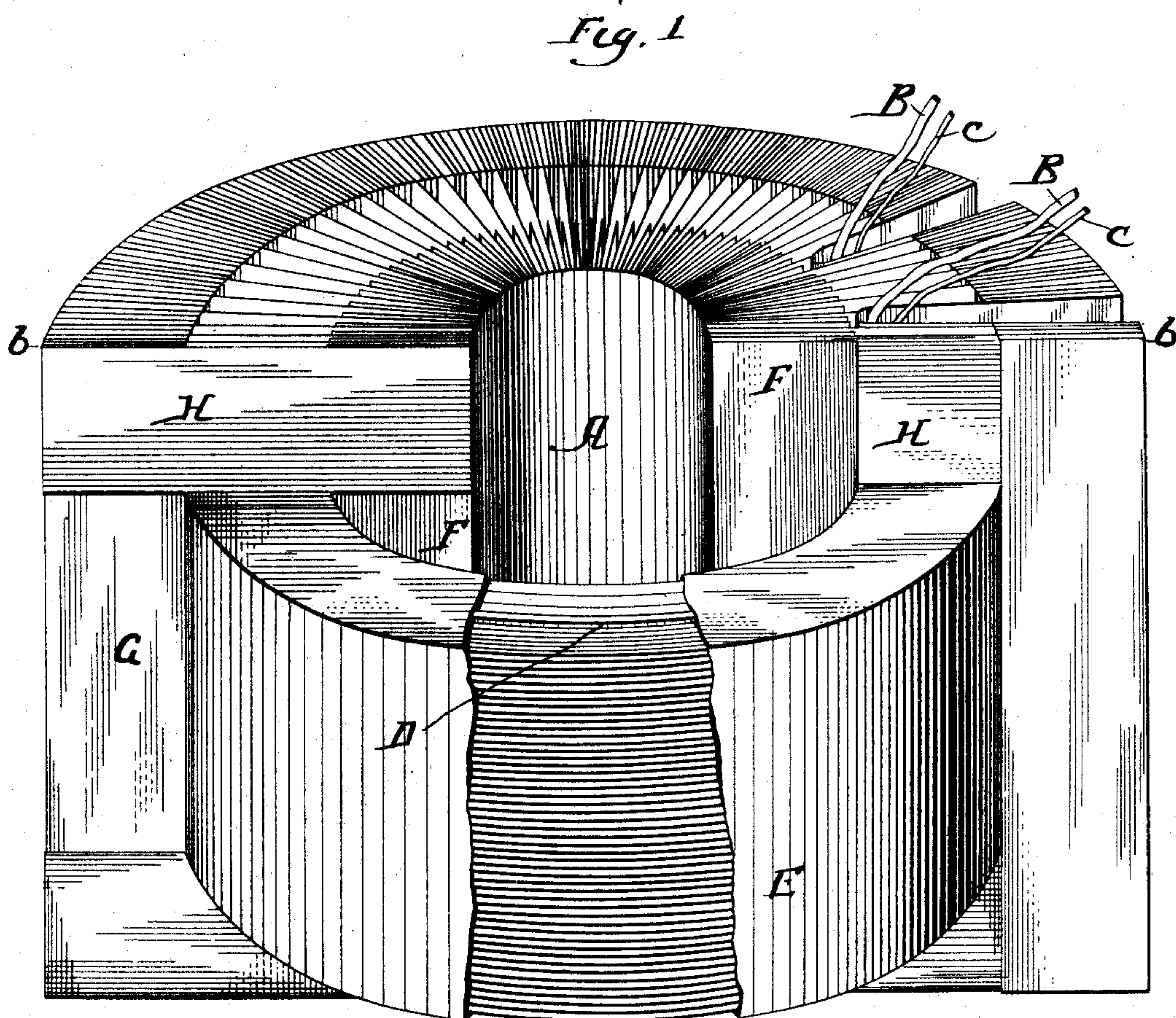
(No Model.)

3 Sheets—Sheet 1.

C. E. KAMMEYER.  
INDUCTION COIL OR TRANSFORMER.

No. 432,050.

Patented July 15, 1890.



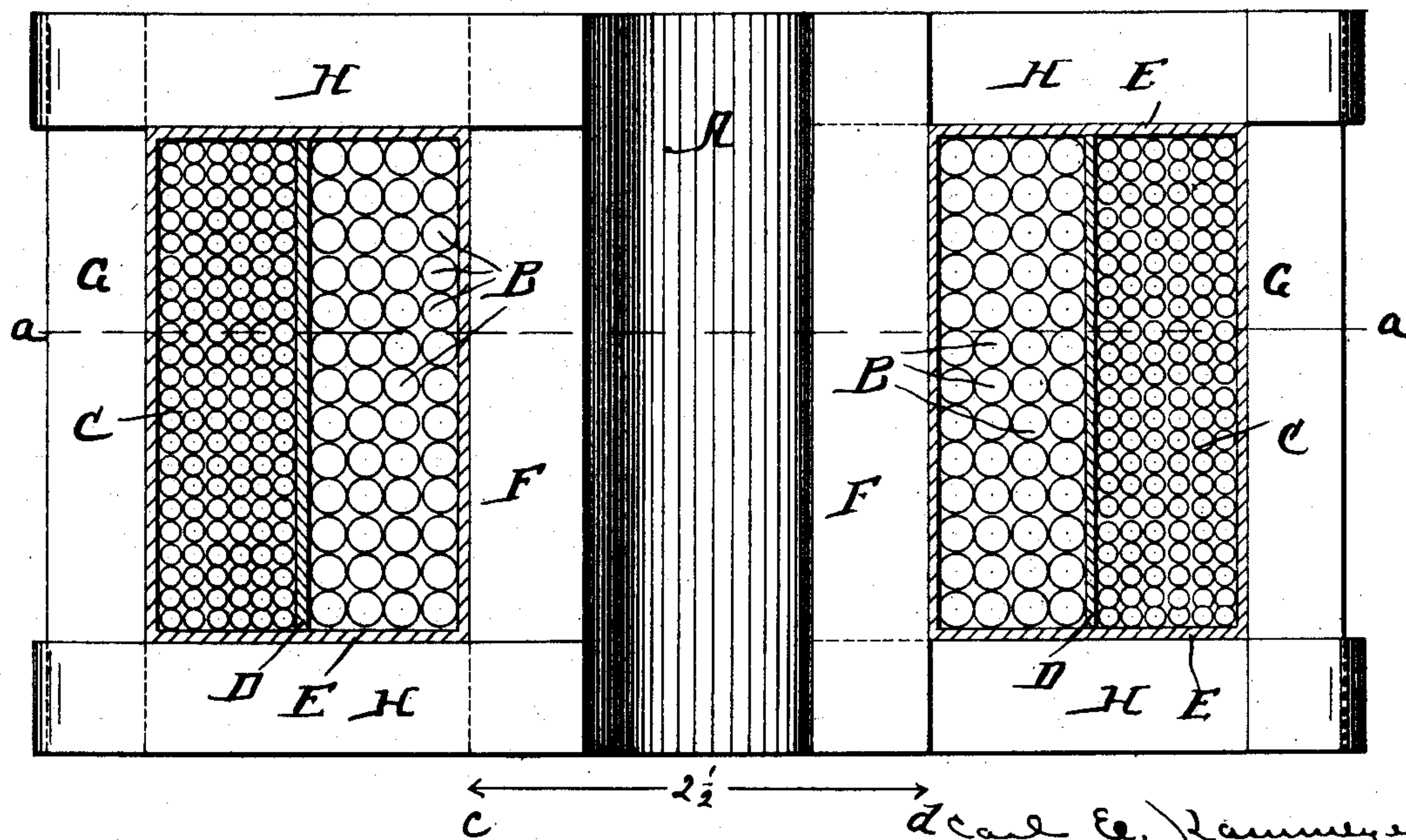
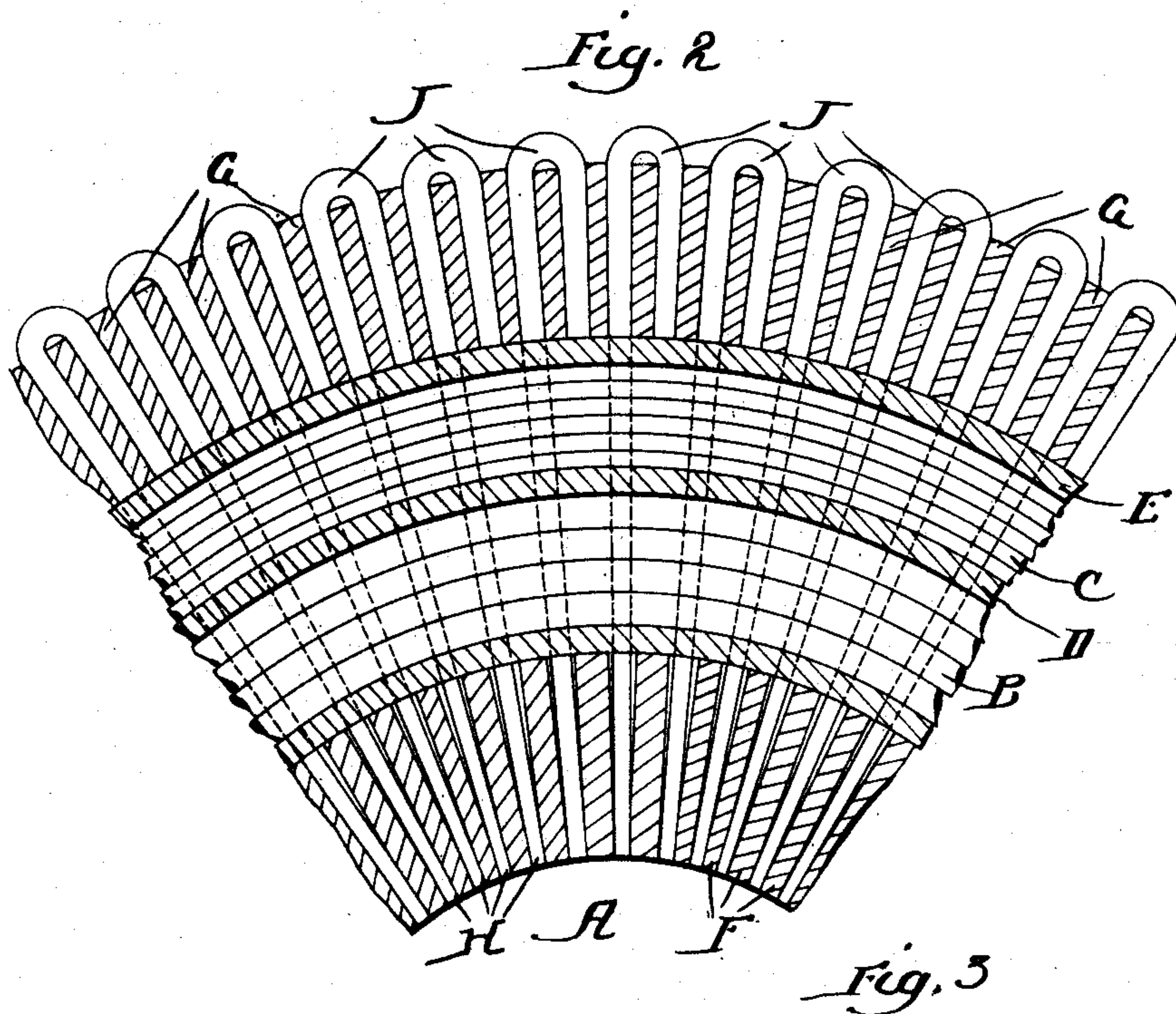
*Witnesses*  
*Celeste P. Chapman*  
*Jean Elliott*

*Inventor:*  
*Carl E. Kammerer*  
*by Francis W. Parker*  
*Attorney.*

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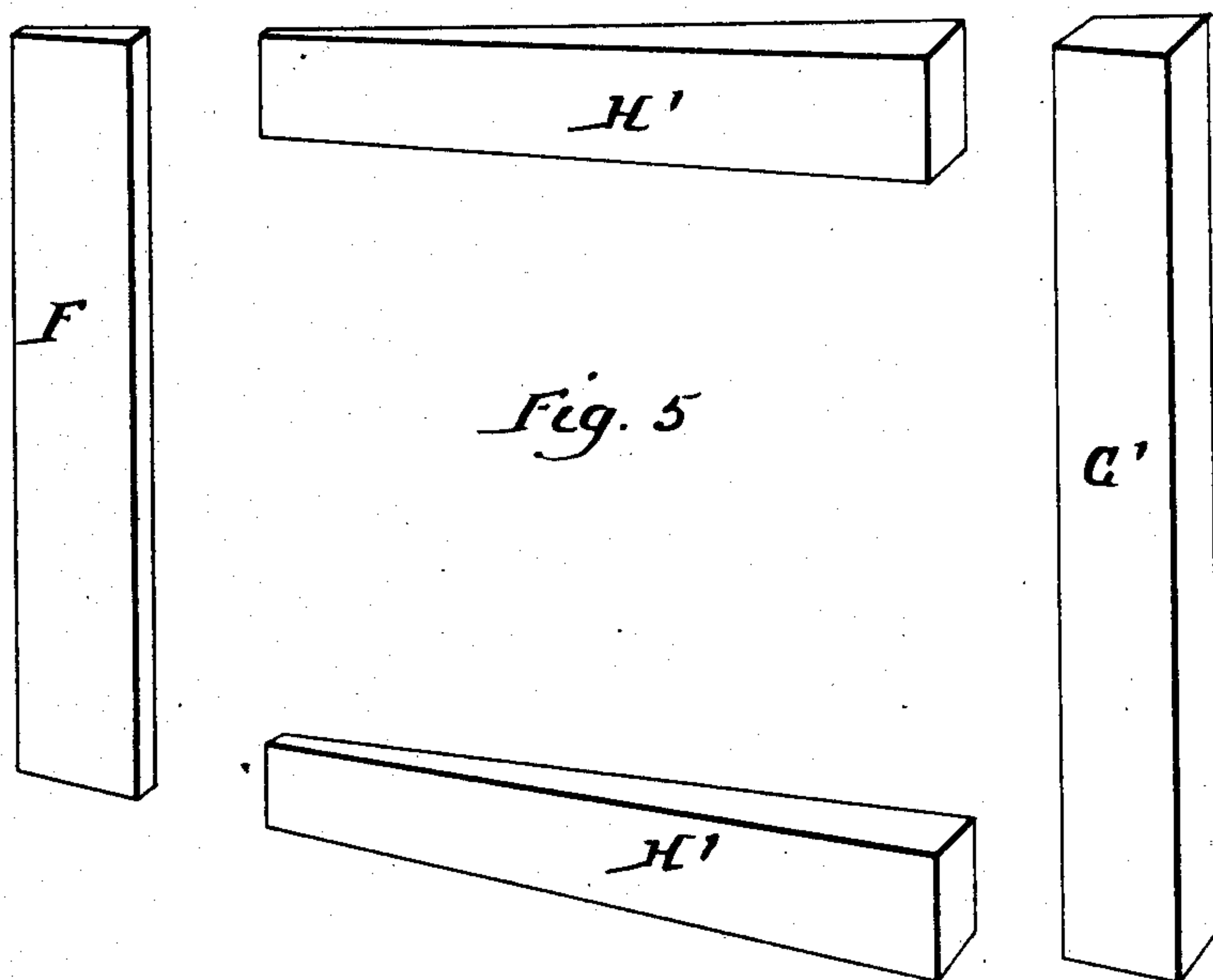
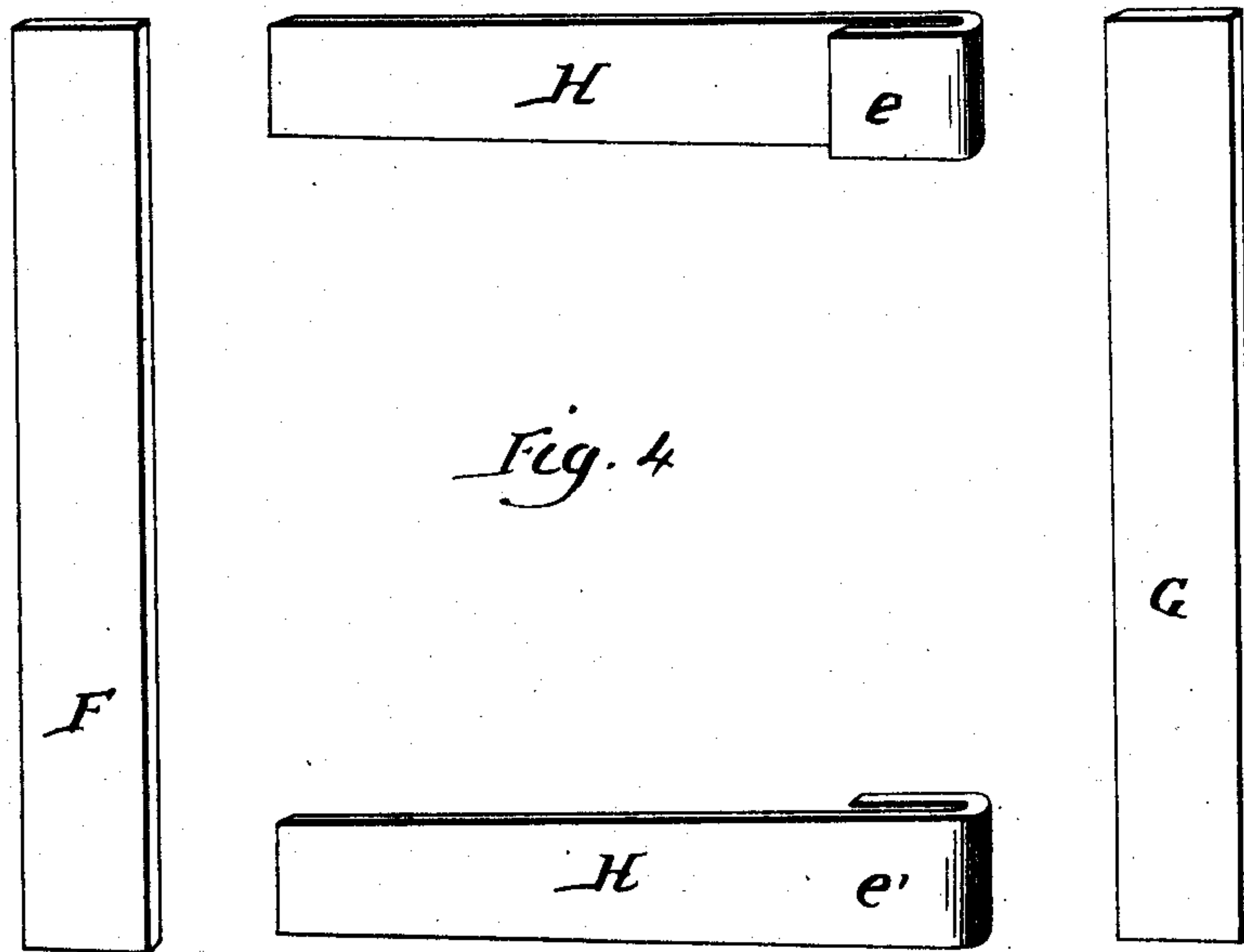
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3 Sheets—Sheet 3.

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Carl E. Kammerer  
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# UNITED STATES PATENT OFFICE.

CARL E. KAMMEYER, OF EAU CLAIRE, WISCONSIN.

## INDUCTION-COIL OR TRANSFORMER.

**SPECIFICATION** forming part of Letters Patent No. 432,050, dated July 15, 1890.

Application filed April 1, 1890. Serial No. 346,186. (No model.)

*To all whom it may concern:*

Be it known that I, CARL E. KAMMEYER, a citizen of the United States, and a resident of Eau Claire, in the county of Eau Claire and State of Wisconsin, have invented a certain new and useful Improvement in Induction-Coils or Transformers, of which the following is a full, clear, and exact specification.

The object of my invention is to produce a cheap and simple induction-coil or transformer, more particularly such as are used for electric-lighting purposes.

My invention consists in certain novel features, which will be readily understood from the following description, taken in connection with the accompanying drawings.

Figure 1 is a perspective view of an induction-coil or transformer with a portion of the magnetic field cut away, exposing the primary and secondary wire coils. Fig. 2 is a partial horizontal section along the line *a a* of Fig. 3. Fig. 3 is a vertical section through the line *b b* of Fig. 1. Figs. 4 and 5 are detail views of iron plates of which the magnetic field is composed.

It is well known that a circular form of coil enables us to arrange or place a definite number of feet of wire or ampère turns, so as to occupy the least possible space; and my invention, among other things, provides plates or punchings of sheet-iron or other magnetic metal, which can be arranged around a circular coil or coils of wire and still have the magnetic metal evenly distributed about the sides of the coil. To accomplish this, I preferably wind the coil or coils of wire on a mandrel having a given diameter, as shown at *c d*, Fig. 3, and continue winding until the outer diameter of the coil becomes about twice as great as its inner diameter. Then if the iron plates or punchings are made with a suitable taper, as shown in Fig. 5, they can be built up around the coils of wire, so as to completely surround them, and at the same time will pack solidly, so as to retain their position. To facilitate the manufacture still more, the strips of magnetic metal running across the top and bottom sides of the wire coils may be bent double upon themselves at the other end, as shown at *e e'* of Fig. 4.

The combined action of the wire coils and

magnetic field being well understood in art, need not be described further in detail.

Referring more particularly to the drawings, A is a central aperture; B, the secondary coils; C, the primary coils; D, insulation between the two coils, and E canvas or other covering to surround the coils.

F F are inner vertically-arranged strips, and G G are similar outer vertically-arranged strips.

H H are upper and lower radially-arranged strips, their inner ends lying between the strips F F and their outer ends provided each with the bend J, so as to inclose one of the strips G.

The parts are put together and arranged briefly in the following manner: The secondary coil is first wound on the mandrel and an insulation covering placed upon it, and the primary coil is then wound and the whole is suitably incased in canvas or other suitable material. The coil is then suitably supported, and the inner vertical strips F F, the outer vertical strips G G, and the upper and lower radial strips H H are placed in position, substantially as shown. The strips are driven securely in, and, being shaped as shown, the whole forms a secure mass, which can be suitably retained within a proper case. The strips H H may be replaced by the wedge-shaped strips H' H', and also the strips G G by the wedge-shaped strips G' G'.

I do not limit myself to any particular form of plates, as the shapes may be greatly modified without departing from the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

1. In an induction-coil or transformer, the combination of a magnetic core built up of iron plates arranged radially around such wire coils, a portion of such plates having their ends bent double upon themselves.
2. In an induction-coil or transformer, the combination of primary and secondary coils wound in circular form with surrounding strips of nearly uniform size, the outer circle of which contains about twice as many as the inner, and which together inclose the entire coil.



3. In an induction-coil or transformer, the combination of plates arranged on the upper and lower side of the wire coils, such plates having their outer ends bent upon themselves  
5 for the purpose of retaining the vertical plates in position.

4. In an induction-coil or transformer, the combination of cylindrical conductor coils, with plates lying substantially in planes  
10 radial to the axis of the coil and arranged so as to be held in position by other plates, said plates substantially inclosing the whole of such conductor-coils.

5. In an induction-coil or transformer, the  
15 combination of a cylindrical coil or conductor

wire with strips on the four sides thereof, the inner strips wedge-shaped, and all lying substantially in planes radial to the axis of the cylinder.

6. In an induction-coil or transformer, the  
20 combination of a cylindrical coil or conductor wire with strips on the four sides thereof, the inner strips wedge-shaped, the outer strips secured to and held by the upper and lower strips, and all lying substantially in planes  
25 radial to the axis of the cylinder.

CARL E. KAMMEYER.

Witnesses:

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