

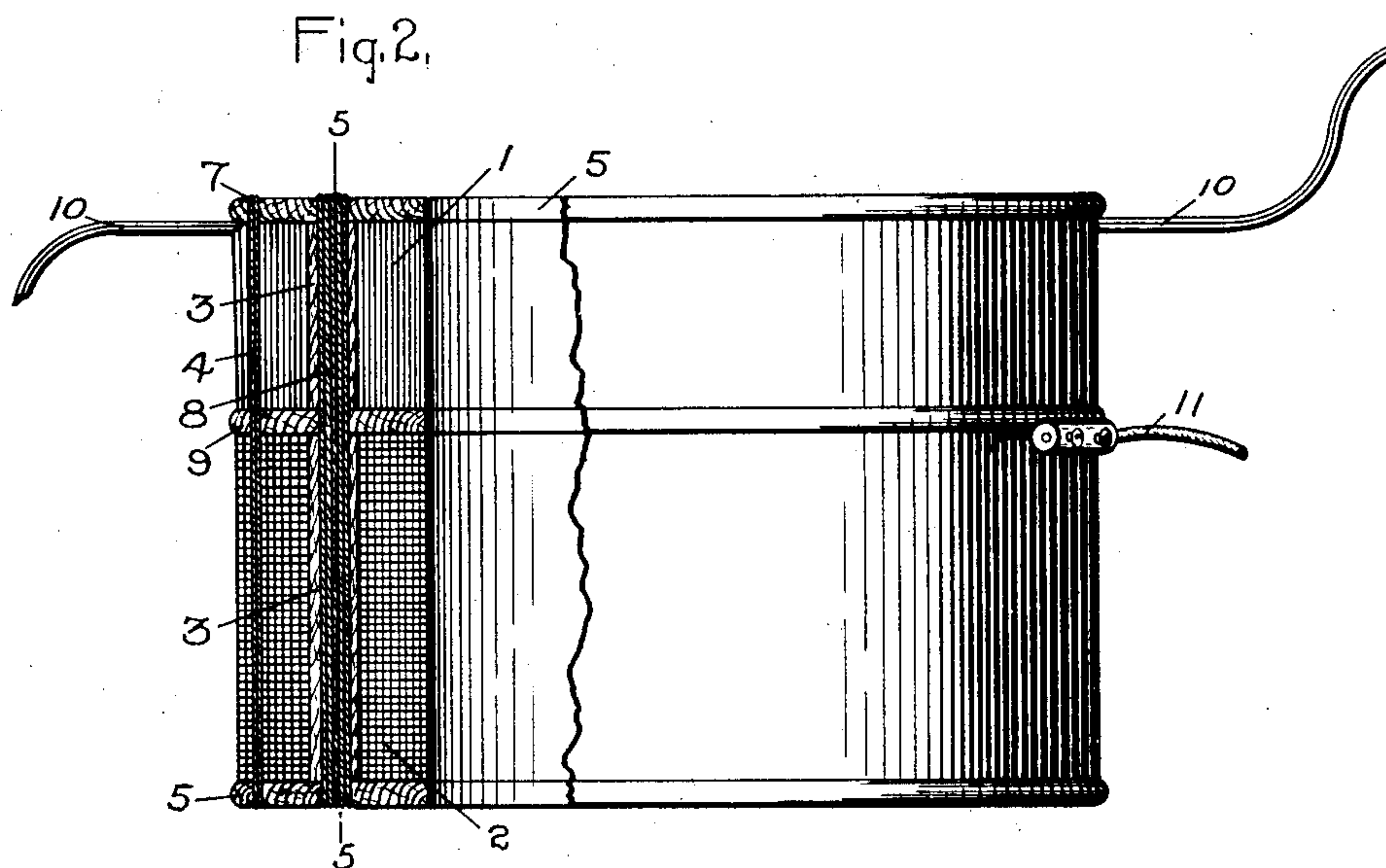
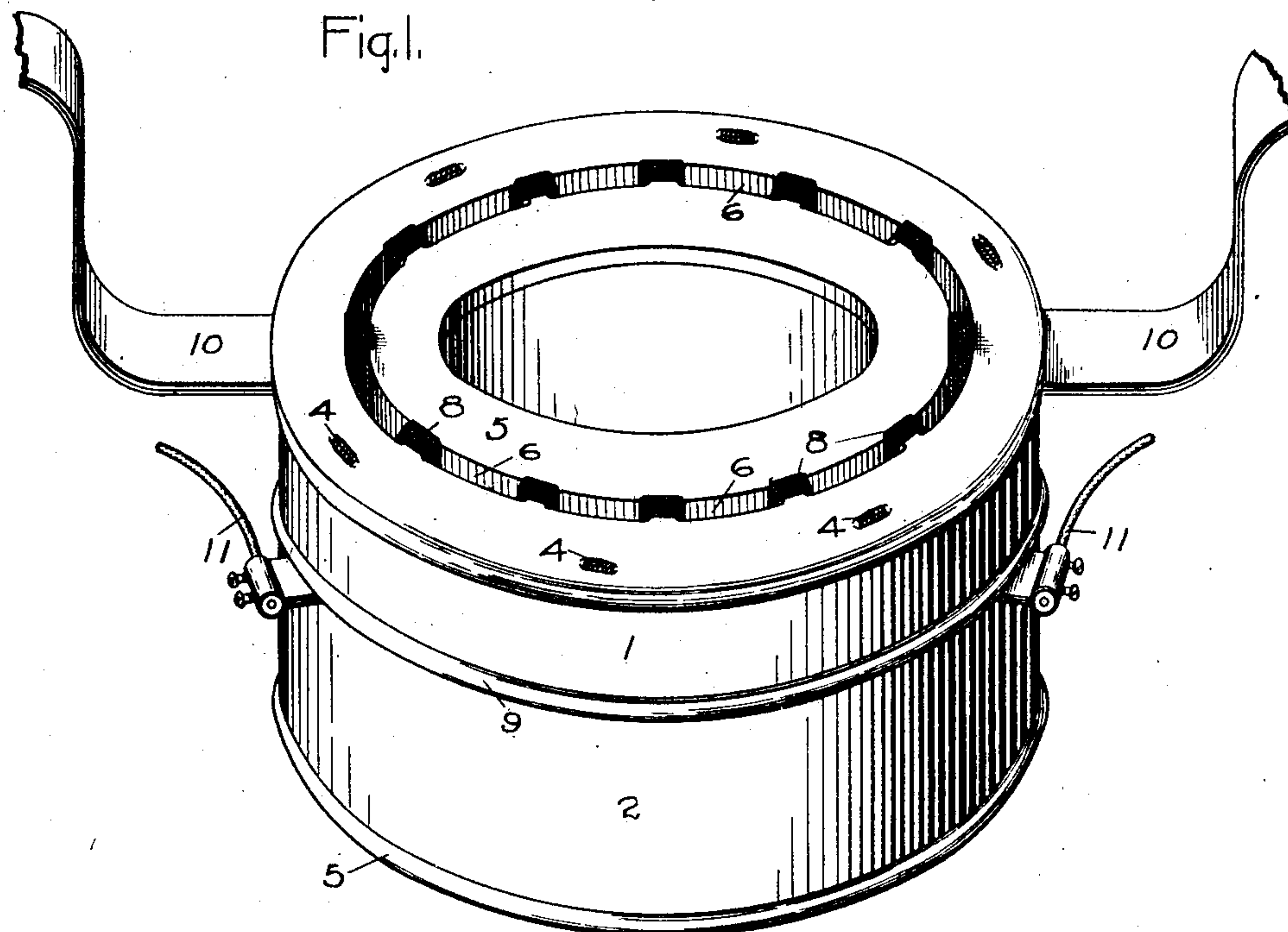
No. 750,980.

PATENTED FEB. 2, 1904.

C. H. KALER.
FIELD COIL STRUCTURE.
APPLICATION FILED AUG. 5, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 3.

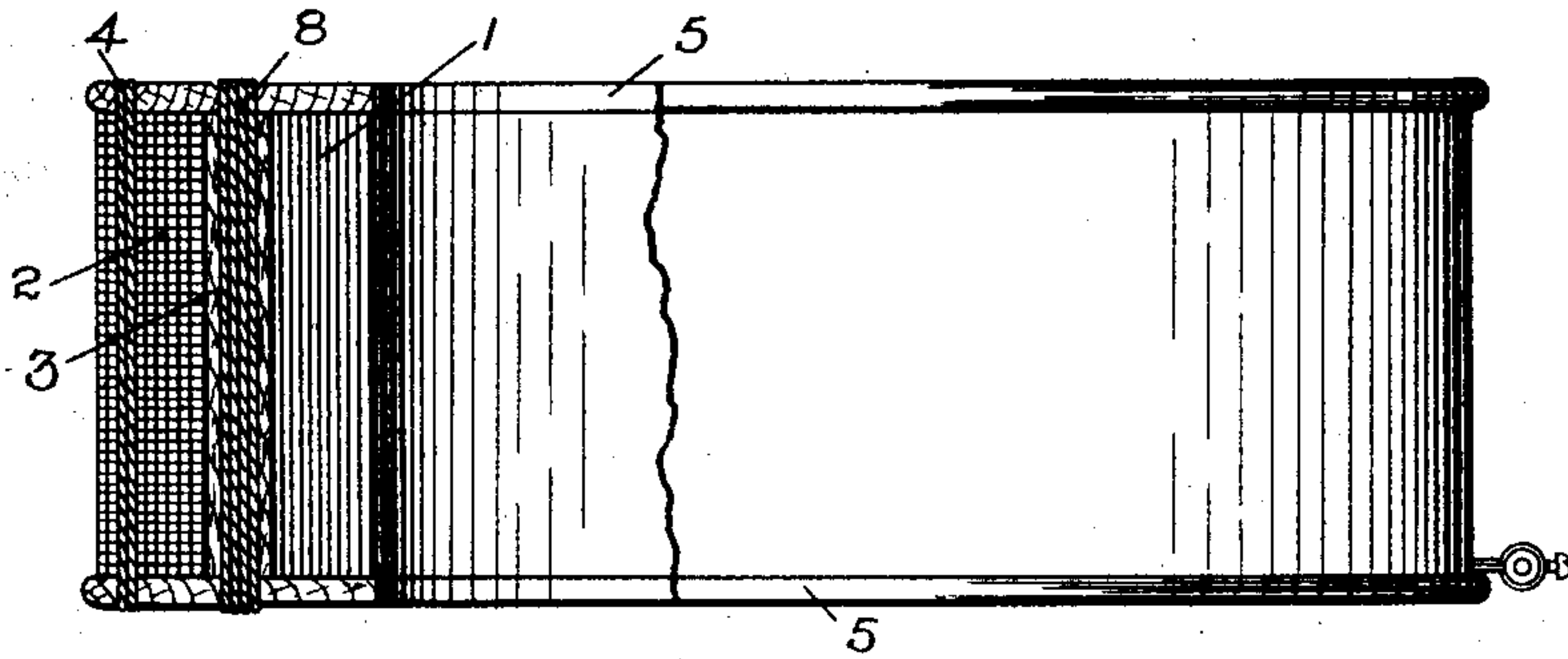


Fig. 4.

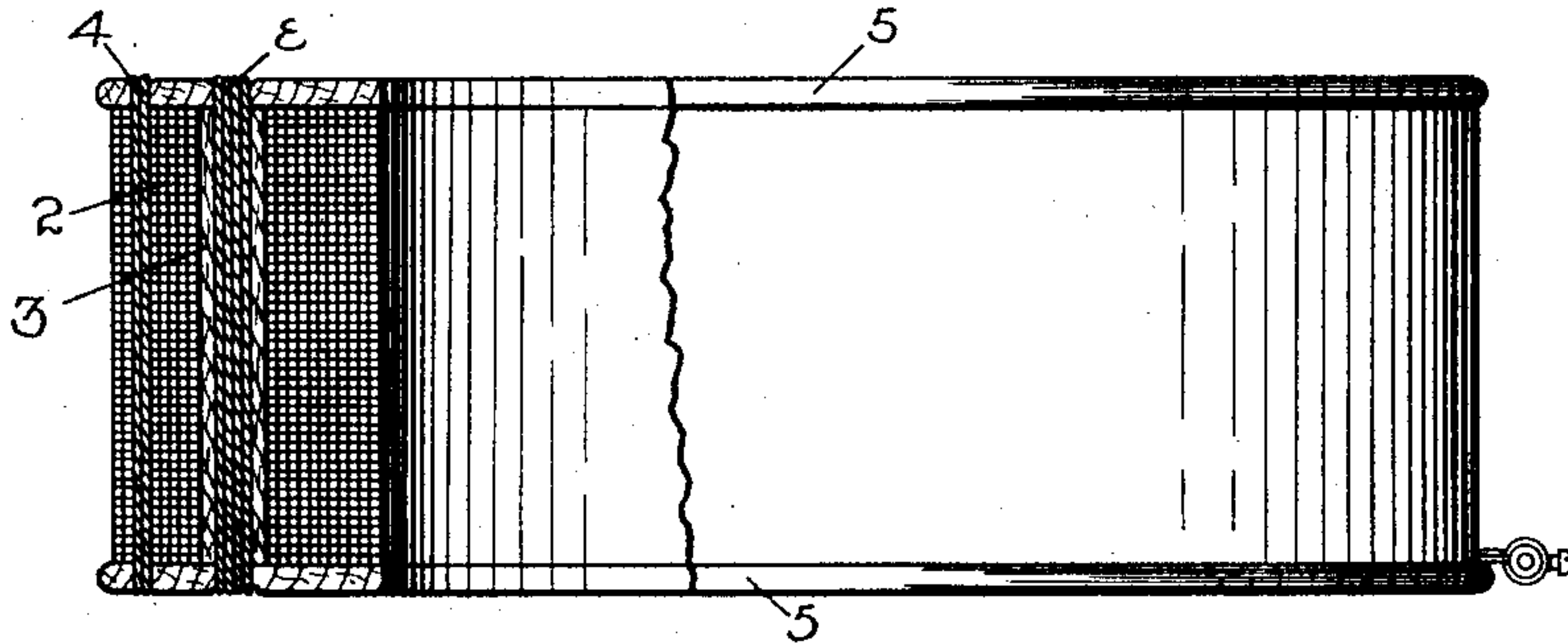


Fig. 5.

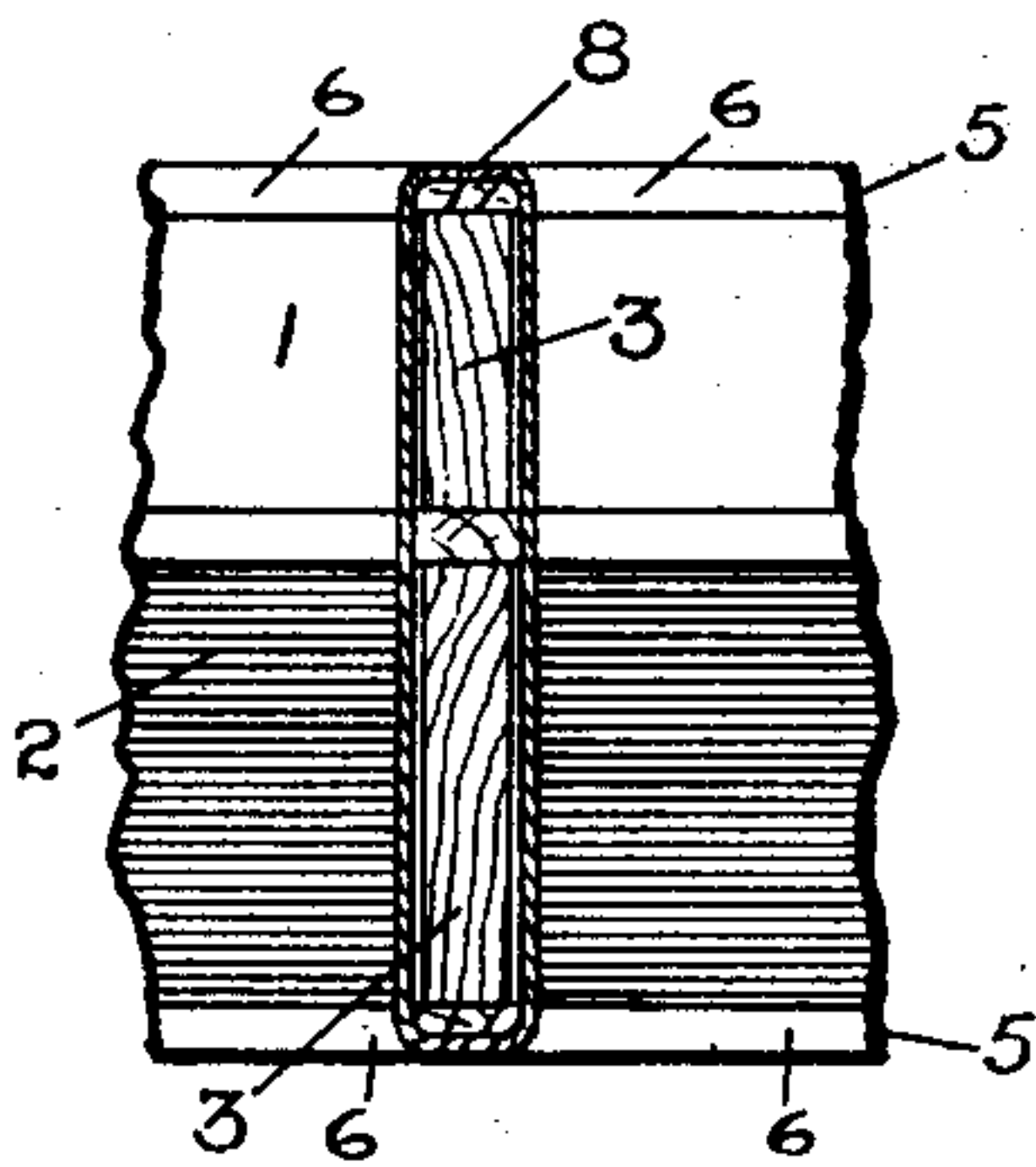
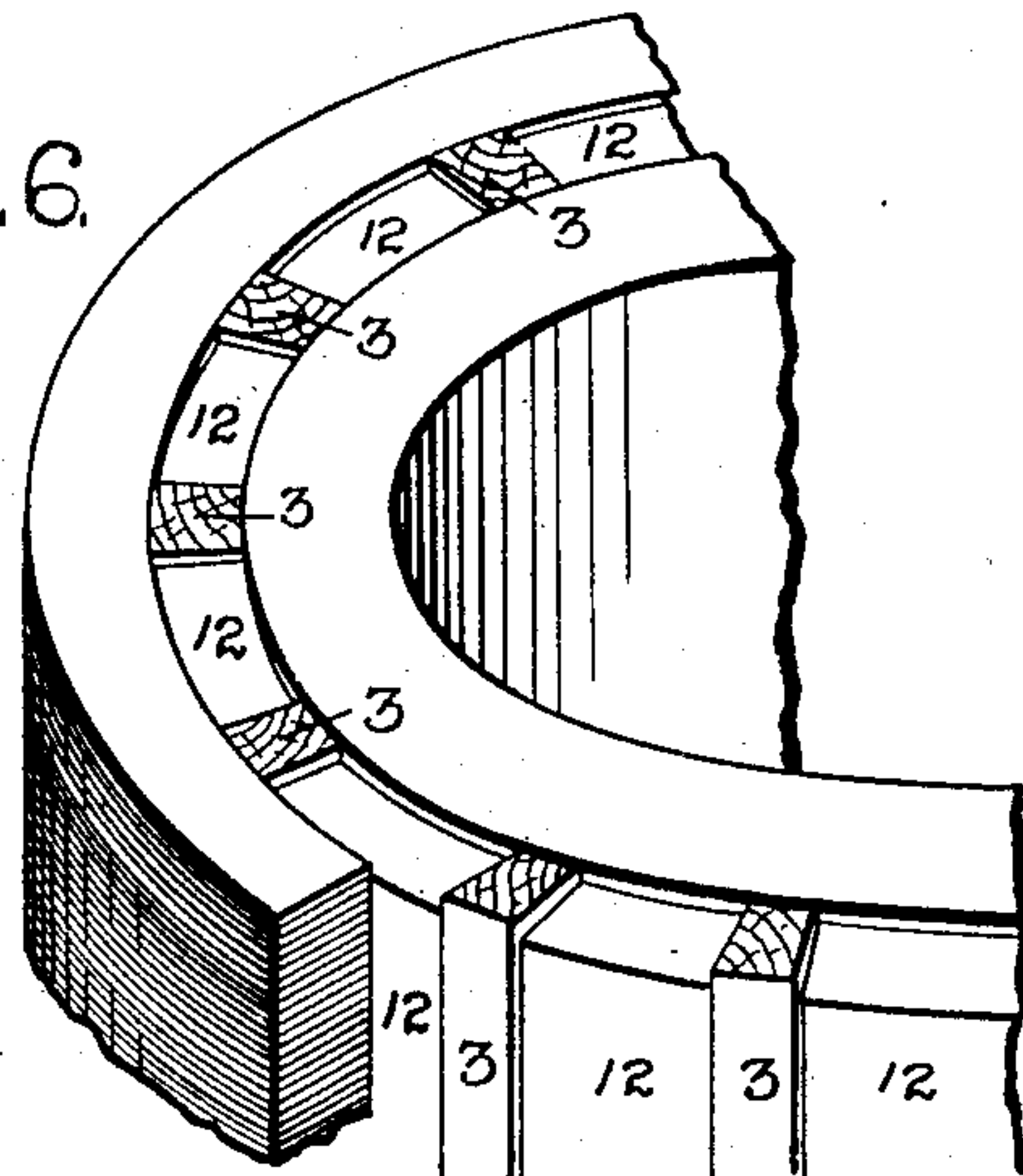


Fig. 6.



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UNITED STATES PATENT OFFICE.

CHARLES H. KALER, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

FIELD-COIL STRUCTURE.

SPECIFICATION forming part of Letters Patent No. 750,980, dated February 2, 1904.

Application filed August 5, 1902. Serial No. 118,484. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. KALER, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Field-Coil Structures, of which the following is a specification.

This invention relates to dynamo-electric machines; and its object is to improve the construction of the field-coils of such machines in order that a ventilated coil may be produced at low cost having a strong rigid structure in which no metal is used except the copper conductor composing the coil proper. I accomplish this end by winding the coil in two concentric sections separated by longitudinal wooden space-blocks and protecting the ends of the coil by annular end plates of wood or other cheap rigid material containing slots registering with the space between the sections of the coil and firmly lashed to the coils by cords or other flexible fastenings passing through said slots along each side of the space-blocks. The edges of the end plates may be secured by cords passing under the outer layers of the outer coil-section and through holes near the edges of said plates. The coils may consist of as many sections as may be desirable and may comprise either a series winding of flat copper ribbon or a shunt-winding of smaller copper wire or a compound winding consisting of a series coil and a shunt-coil grouped together in one structure.

In the accompanying drawings, Figure 1 is a perspective view of a coil comprising a compound winding wound in two concentric sections, the series winding being superposed upon the shunt-winding. Fig. 2 is a side elevation of the same, partly in longitudinal section. Fig. 3 is a similar view showing the series winding concentric with the shunt-winding, each coil comprising one section only. Fig. 4 is a similar view of a shunt-coil having two concentric sections. Fig. 5 is a longitudinal section on the line 5 5, Fig. 2. Fig. 6 shows a portion of a coil with removable shaping-keys.

In making a coil according to my invention

the insulated conductor 1 or 2 is wound on a former as usual until the inner section of the coil is completed. The wooden space-blocks 3 are then laid longitudinally against the outside of the section and spaced evenly apart, and the winding is continued outside of and upon said blocks until the one or more outer sections are nearly completed. Flexible fastenings, such as cords 4, are then laid upon the outside of the coil at regular distances apart and two or more finishing-layers of the conductor are wound outside of them. The winding thus binds the space-blocks 3 and the cords 4 firmly in place. The coil is then removed from the former, and annular end plates 5, of wood or other light rigid cheap material, are laid against its ends. The plates have a series of slots 6 concentric with the edges thereof and registering with the space between the sections of the coil, so that each plate is composed of two concentric rings united by short integral radial bridges, which are so spaced that they coincide with the space-blocks. The ends of the cords 4 are passed through holes 7 in the end plates and are tied tightly to keep the edges of the end plates from warping away from the coil. Flexible fastenings, such as cords 8, are then passed through the slots 6 and the space between the coil-sections on each side of the space-blocks 3, and after being pulled tight said cords are tied over the bridges to retain the end plates on the coil and clamp the whole into a solid structure. The bridge may be cut away slightly to let the cords 8 in flush with the surface of the plates, as shown most clearly in Fig. 5.

If a compound-wound coil is to be made, the series winding 1 may be superposed upon the shunt-winding 2, as in Figs. 1 and 2, or it may be concentric therewith, as in Fig. 3. In either case it may be in one or more sections, as desired. An annular plate 9, similar to the end plates, is interposed between the two coils when one is superposed upon the other and the cords 4 8 are carried through both coils and tied upon the outside of the end plates, as before, to clamp the entire structure

solidly together. The terminals of the series winding are seen at 10 and of the shunt-winding at 11.

When a coil of this construction is placed upon a pole-piece of a generator, it will of course be properly insulated therefrom by paper or mica.

If it is desired to have the outer coil-sections true cylinders, removable shaping-keys 12 may be laid between the space-blocks 3, each key being the segment of a cylinder, so that the keys and space-blocks will present a continuous cylindrical surface on which the next outer coil-section can be wound. After the coil is finished the shaping-keys are knocked out, leaving the spaces between the space-blocks for ventilation. This mode of construction is especially advantageous where the conductor is a flat ribbon wound edgewise.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A field-coil comprising two or more concentric sections separated by space-blocks, end plates having slots registering with the spaces between said blocks, and flexible fastenings passing through said slots and spaces and securing the parts together.

2. A field-coil comprising two or more concentric sections separated by space-blocks, end plates having slots registering with the space between the coil-sections, and cords passing down each side of said space-blocks

and around the bridges of the end plates between said slots.

3. A field-coil comprising two or more concentric sections with an annular space between them, wooden end plates having slots registering with said annular space, longitudinal blocks in said space in line with the bridges of the end plates between said slots, cords passing through said slots and space and tied over the bridges, and other cords lying under the outer layers of the outer section and tied through holes near the edges of the end plates.

4. A field-coil having end supports held by means of longitudinal cords confined between layers of its winding.

5. A field-coil having longitudinal cords confined between layers of its winding, and wooden end plates provided with holes through which said cords are passed and tied.

6. A field-coil comprising two concentric cylindrical sections wound successively, with space-blocks between said sections, and removable shaping-keys between the space-blocks to maintain the outer section in a true cylindrical form.

In witness whereof I have hereunto set my hand this 4th day of August, 1902.

CHARLES H. KALER.

Witnesses:

BENJAMIN B. HULL,
JOS. A. L. ENDRES.