

**929,607.**

Patented July 27, 1909.

Fig. 1.

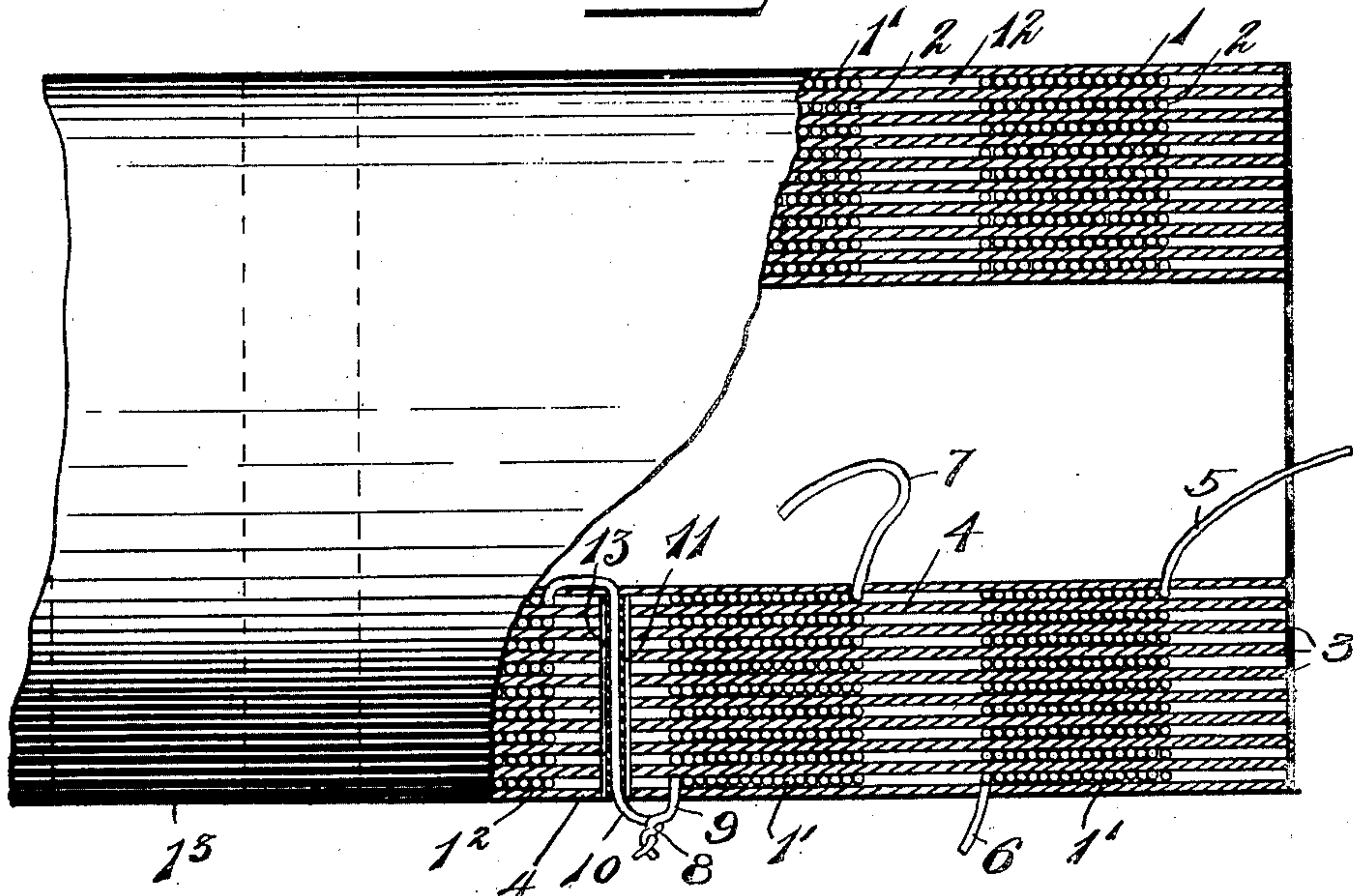
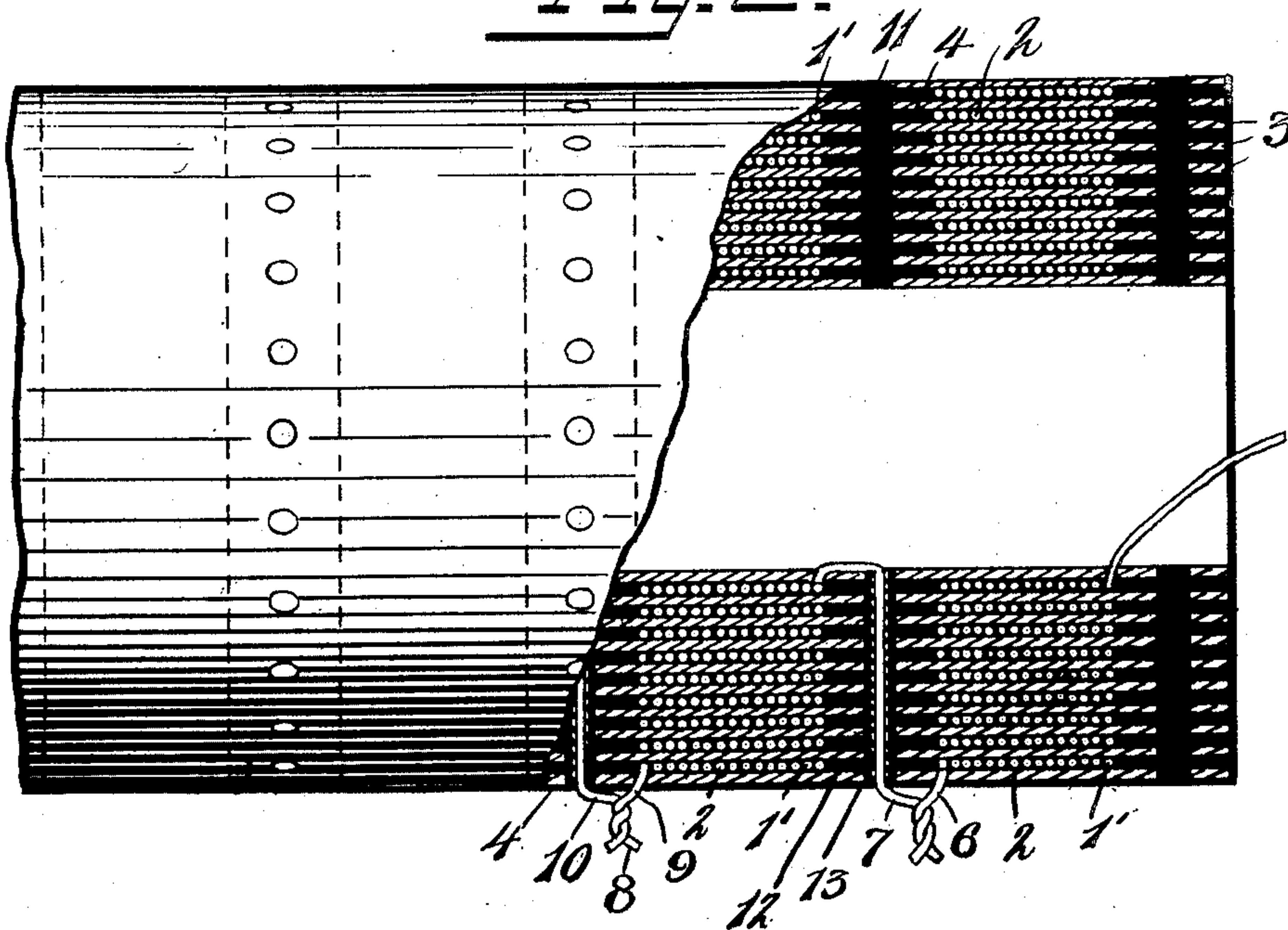


Fig. 2.



Charles Parrot

Inventor

B. L. LAYTON.

Deputy U.S. Attorney &  
Ransom B. Smith & Mitchell



# UNITED STATES PATENT OFFICE.

BURTON L. LAWTON, OF MERIDEN, CONNECTICUT, ASSIGNOR TO THE CONNECTICUT TELEPHONE & ELECTRIC COMPANY, OF MERIDEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

## INDUCTION-COIL.

No. 929,607.

Specification of Letters Patent.

Patented July 27, 1909.

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*To all whom it may concern:*

Be it known that I, BURTON L. LAWTON, a citizen of the United States, residing at Meriden, county of New Haven, State of Connecticut, have invented certain new and useful Improvements in Induction-Coils, of which the following is a full, clear, and exact description.

My invention relates to coil windings, and is particularly concerned with the construction of coils in which the windings are arranged in a plurality of separate sections throughout the length of the coil.

The object of the invention is to so construct and wind the different sections of the coil that said several sections may present a unitary structure in the completed coil. In the method of winding coils of this character heretofore employed, a plurality of wires are wound in separate adjacent coil sections having a single sheet of insulating material, as paper, wound between each of the separate layers of said sections. After the several coils are thus wound, they are separated into single coils by cutting through the dividing walls or partitions, and said single coils are then treated with suitable insulating composition, such as paraffin, to fill the interstices between the layers of insulating material or paper which separate the several layers of each coil. In this form the separate coils are supplied to the trade, and when it is desired to assemble several of said coils upon a core, the same are strung thereon and the ends of the wires of each coil united to provide the necessary electrical connections between the separate coil sections. This method of forming the completed coil composed of separate coil sections involves a number of operations which augment materially the expense of manufacture, and furthermore, the necessity of uniting the terminals of the separate coil sections by the user is frequently carelessly done, whereby said terminals are not properly insulated and the coil is thereby rendered comparatively ineffective and useless.

My invention is aimed to overcome these difficulties and to produce a coil composed of the several coil sections as a complete and unitary structure with the terminals of the several sections properly united, and with the layers of insulating material interposed between the several layers of said coils extending continuously throughout the entire

length of the completed coil and with the terminal wires of the separate coil sections lying between and effectually insulated to prevent a short circuit with said sections.

A further object of the invention is to treat such unitary structure with insulating composition, which shall fill all of the interstices between the layers of each coil section and the interstices in the partition walls between the coil sections, and thus furnish a coil composed of a plurality of several coil sections thoroughly insulated from each other and forming a unitary structure.

With these and other objects in view, my invention consists in the method of winding and in the construction and arrangement of parts illustrated in the accompanying drawings, in which,

Figure 1 is a view partly in section of a coil winding illustrating the structure and arrangement of the several coil sections before the terminals thereof are united and before the same has been treated with the insulating composition. Fig. 2 is a view similar to Fig. 1, showing terminals of the coils properly united and illustrating the structure after the coil has been treated with the insulating composition.

In the embodiment of my invention herein selected for illustration, and referring particularly to Fig. 1, 1, 1', 1<sup>2</sup>, etc., indicate the separate or sectional coil windings consisting of the coil layers 2, between which layers are interposed sheets 3 of insulating material, such as paraffin paper, said layers of insulating material, as shown, extending continuously throughout the length of the completed coil. Those portions 4 of the insulating sheets between the coil sections, 1, 1', 1<sup>2</sup>, etc., serve to form an insulating wall or partition between said sections. 5 indicates one terminal of the right-hand end coil section 1, by which the coil may be connected with other apparatus as the terminal of a primary winding. 6 indicates the opposite or outer terminal of the same coil section, which, as here shown, has not yet been united with the inner terminal 7 of the adjacent coil section 1'.

The manner of uniting the terminals of the adjacent coil sections is illustrated at 8, Figs. 1 and 2, wherein the outer terminal 9 of the coil section 1', is shown as connected with the inner terminal 10 of coil section 1<sup>2</sup> which has been led out through a perforation 11 extending radially through the insulating



layers 3 of the partition wall 4, between said coil sections. The outer terminal of the section 1<sup>2</sup> is similarly united with the inner terminal of the next adjacent coil section 1<sup>3</sup> to the left. It will thus be seen that the separate coil sections are held together in proper relative position by the continuous layers 3 of insulating material which constitute the framework or skeleton of the completed coil and of the dividing walls or insulating partitions 4 between the adjacent coil sections. When the parts have been so assembled, the coil as a whole is subjected to treatment in a vacuum chamber in order to draw out all vestiges of moisture and air from the interstices between the coil windings and the insulating layers. When the coil is thoroughly freed from such moisture and air, and while still in the vacuum chamber, it is treated with a proper insulating composition 12, which, owing to the vacuum, penetrates thoroughly into all of the interstices between the windings and the layers of insulating material whereby the layers of the coils are the more thoroughly insulated from each other, and the spaces between the layers of insulating material constituting the skeleton or framework of the separating walls or partitions 4 are also thoroughly filled with said insulating composition, whereby also the coils are thoroughly insulated from each other. By this means all possibility of short-circuiting between the separate coil sections and between the coils and the adjacent connecting terminals is prevented.

If desired for more thorough insulation of the connecting wires, the same may be surrounded by suitable bushings 13 of insulating material before the coil is treated with the insulating composition.

The coil thus constructed and consisting of the several separate coil sections, as described, together with the dividing walls or partition presents a unitary structure with the separate sections properly connected and insulated to prevent short circuiting between the sections or between said sections and the adjacent connecting wires.

While I have herein illustrated and described a particular construction of coil and

method of manufacturing the same, the details of said structure and said method may be varied within the scope of my invention.

What I claim is:

1. In a coil winding, a plurality of separate coil sections having sheets of insulating material interposed between the separate layers thereof and extending continuously between said sections forming partition walls, the inner terminal of one of said sections being led out through said partition wall and united to the outer terminal of the adjacent section.

2. In a coil winding, a plurality of separate coil sections having sheets of insulating material interposed between the separate layers thereof and extending continuously between said coil sections to form an insulating partition there-between, and an insulating composition interposed between the layers of said insulating sheets within said coil sections and within said partitions.

3. In a coil winding, a plurality of separate adjacent coil sections having sheets of insulating material extending between the layers thereof respectively, and extending continuously between said sections to form an insulating wall, perforations extending radially through said walls, through which a terminal of one of said coil sections is led and united to a terminal of the adjacent coil section.

4. The method of manufacturing coil windings which consists in simultaneously winding a plurality of adjacent coil sections, simultaneously interposing sheets of insulating material between the layers of said sections and extending throughout the length of the completed coil, leading out a terminal of each of said sections through those portions of the insulating sheets interposed between adjacent sections, uniting said terminal to a terminal of an adjacent section, subjecting the completed coil to a vacuum and treating the coil in the vacuum to a bath of insulating composition.

BURTON L. LAWTON.

Witnesses:

E. C. WILCOX,  
L. A. WALKER.