

M. J. WOHL & H. HERTZBERG.
ELECTROMAGNET COIL CONSTRUCTION.
APPLICATION FILED NOV. 18, 1908.

931,542.

Patented Aug. 17, 1909.

FIG. 1.

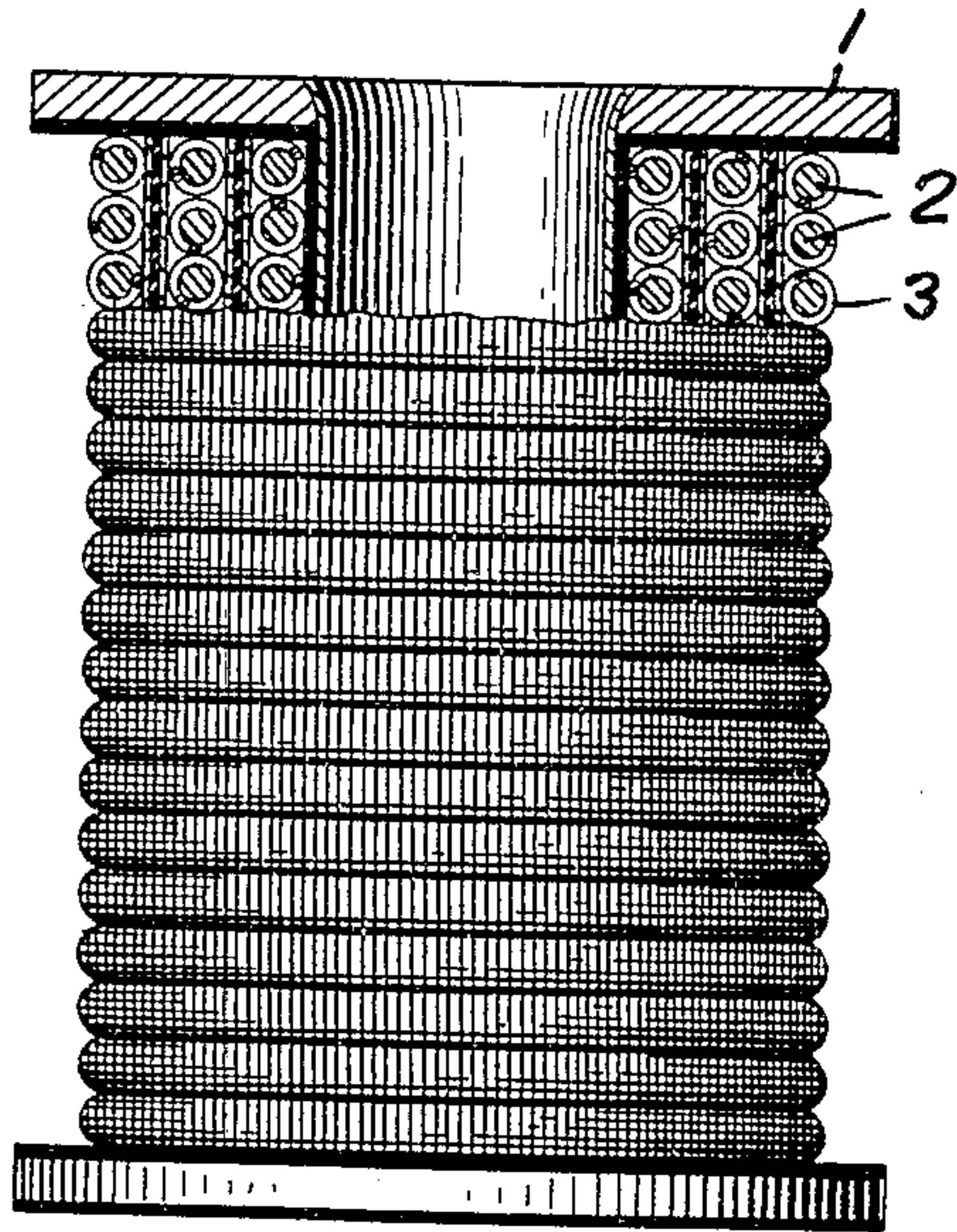


FIG. 2.

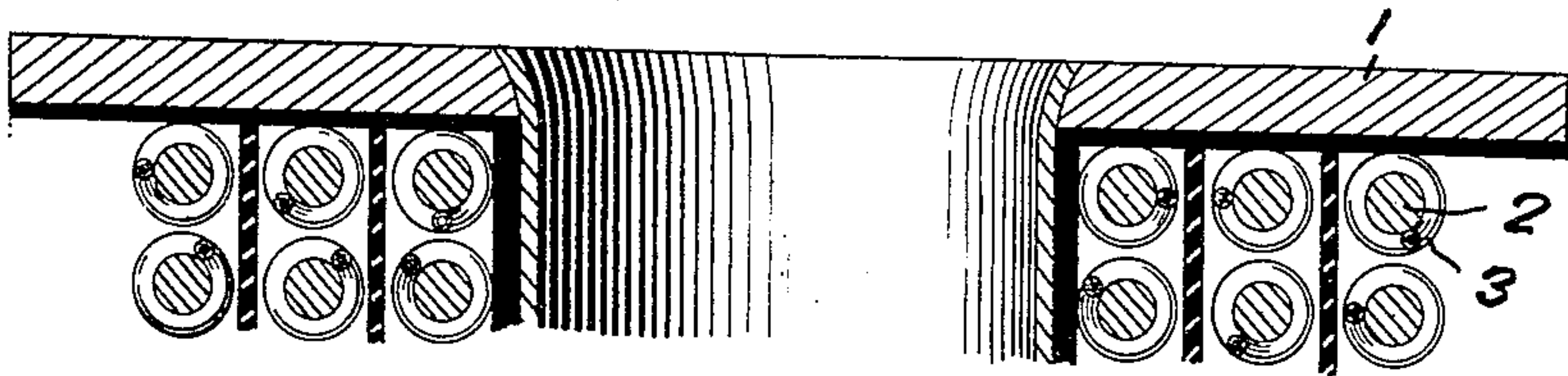


FIG. 3.

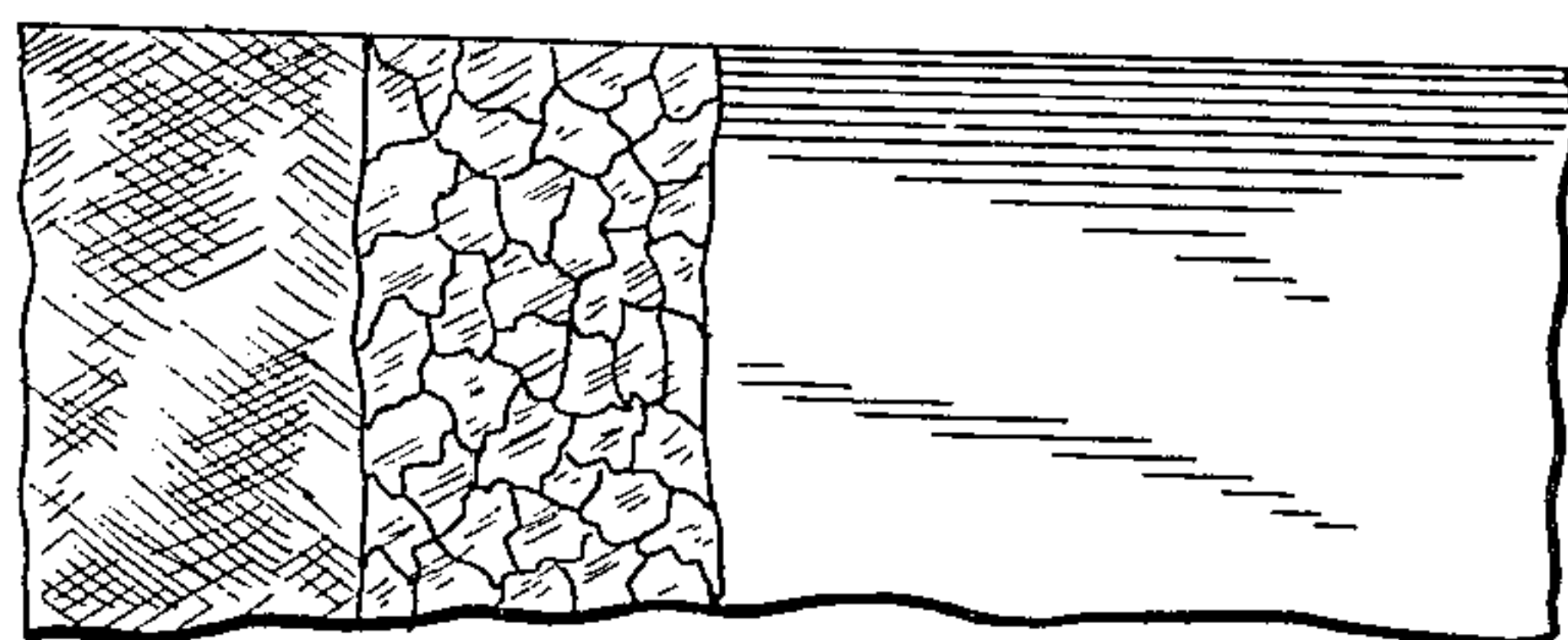
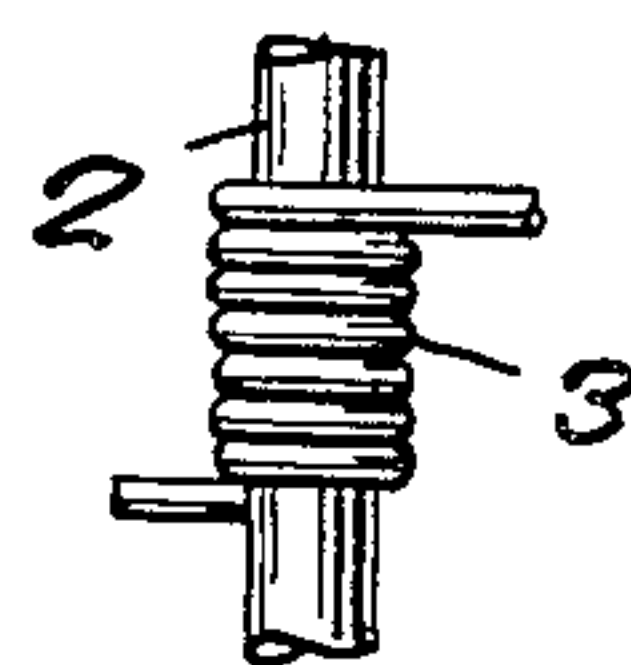


FIG. 4.



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ELECTROMAGNET-COIL CONSTRUCTION.

No. 931,542.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed November 18, 1908. Serial No. 463,236.

To all whom it may concern:

Be it known that we, MAURICE J. WOHL and HARRY HERTZBERG, citizens of the United States, and residents, respectively of the city of New York, borough of Manhattan, county and State of New York, and of the city of New York, borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Electromagnet-Coil Construction, of which the following is a specification.

This invention relates to electromagnet coil construction and has for its object the provision of means for insulating the turns of wire from one another in such a manner that the insulation will not be destroyed by the heat generated in the coil by the passage of the current therethrough or otherwise.

The object of the invention is to avoid the difficulty experienced in electromagnet coils in which the ordinary insulated wire is used or the insulation being destroyed when the coil is excessively heated.

A further object of the invention is to simplify and cheapen the coil construction by employing bare wire instead of the usual insulated wire.

In its general nature this invention is similar to the invention described in our co-pending application Ser. No. 463235, but differs therefrom in several important features, which will be described more fully hereinafter.

In the drawing accompanying this specification like parts in the several views have been given the same reference numbers.

Figure 1 is a side elevation, partially in section, showing the several layers of wire in position. Fig. 2 is an enlarged view of a portion of the coil, similar to Fig. 1, showing the coil after the same has been in use. Fig. 3 shows the composite insulating strip.

Fig. 4 is a view of a portion of the winding. A spool upon which the electromagnet coil is wound is shown at 1. This spool may be of any approved construction and upon the same is wound successive turns of the conductor for the operating current, preferably of copper wire, as shown at 2. Coiled about the turns of the conducting winding are successive turns of an insulator. This insulator is shown in the drawing at 3

and is preferably formed by winding turns of bare aluminum wire about the turns of the conducting wire 2. The aluminum wire oxidizes readily when exposed to the air, especially if some moisture is present, and the oxidation is accelerated when the wire is heated. This forms an insulating coating of oxid for the aluminum wire having sufficient insulating properties to insulate the turns of the conducting wire 2 from one another.

It is understood in electromagnet coil construction for any ordinary purposes the difference in potential or drop between two successive turns of the coil is very small and it has been found by actual tests that a coil wound with bare copper wire for the conducting winding and having wound thereabout turns of bare aluminum wire with a coating of oxid, as described, will operate successfully and will possess the very desirable property of being able to withstand excessive heating caused by an unusual amount of current or from other sources without breaking down. In fact the effect of the heating, as already explained, is to accelerate and increase the formation of the insulating coating of oxid. Where the coil is composed of a plurality of layers of winding, these layers may be insulated from one another by interposing between the same a strip of insulating material. This is preferably a composite strip comprising a central layer of mica and outer layers of a combustible material, such as paper or cloth. Such a strip is shown in Fig. 3. The mica forms a good insulator, but is so brittle that it is practically impossible to wind or place the same in position upon the successive layers of wire but by using a composite strip constructed as described, this is easily accomplished as the strip may be readily wound upon the successive layer of wire, as shown in the drawings. A further advantage obtained by using a composite insulating strip such as described is that when the coil becomes heated the outer layers being of combustible material burn away leaving the layer of mica in place. This provides an additional space which permits the turns of the winding to become separated somewhat, thus increasing the insulating effect.

Fig. 1 shows a coil such as described before use and Fig. 2 shows the same coil after the same has been used and heated, and the

combustible layers burned away from the strip between the layers of the winding, the effect being, of course, somewhat exaggerated in order to show the separation of the 5 turns of the winding, etc., in the drawing.

It will be understood that the foregoing description and drawing are intended to show a preferred embodiment of the invention for the purpose of illustrating the same 10 and the insulator or insulating winding has been described as aluminum wire which is oxidized on its surface. In some cases other forms of an insulating casing, such as a tube of aluminum or other readily oxidizable material having insulating properties, may be 15 employed with the same effect. It is not to be understood, however, that the invention is limited in this respect to any particular material or to the particular form of coil or 20 winding shown and described, as it will be evident that many changes may be made in the details of construction without departing from the scope of the invention.

What we claim is:

25 1. An electromagnet coil wound with turns of copper wire and aluminum wire coiled about the copper wire.

2. An electromagnet coil wound with turns of copper wire and wire coated with an insulating oxid coiled about the copper wire. 30

3. An electromagnet coil comprising a plurality of layers, each layer having successive turns of a conducting winding positioned within an insulating winding, and a composite strip located between said layers comprising a central layer of insulating material and outer layers of combustible material. 35

4. The method of making an electromagnet coil which consists in winding a plurality of layers, each layer having successive turns of a conducting winding positioned within an insulating winding, and successively winding upon said layers a composite strip comprising a central layer of insulating material and outer layers of combustible material. 45

Signed at Brooklyn, N. Y. city, in the county of Kings and State of New York, this 16th day of November, 1908.

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Witnesses:

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