No. 771,237. PATENTED OCT. 4, 1904.

J. J. FRANK.

REACTANCE COIL.

APPLICATION FILED FEB. 2, 1903.

NO MODEL.

Fig. 1.

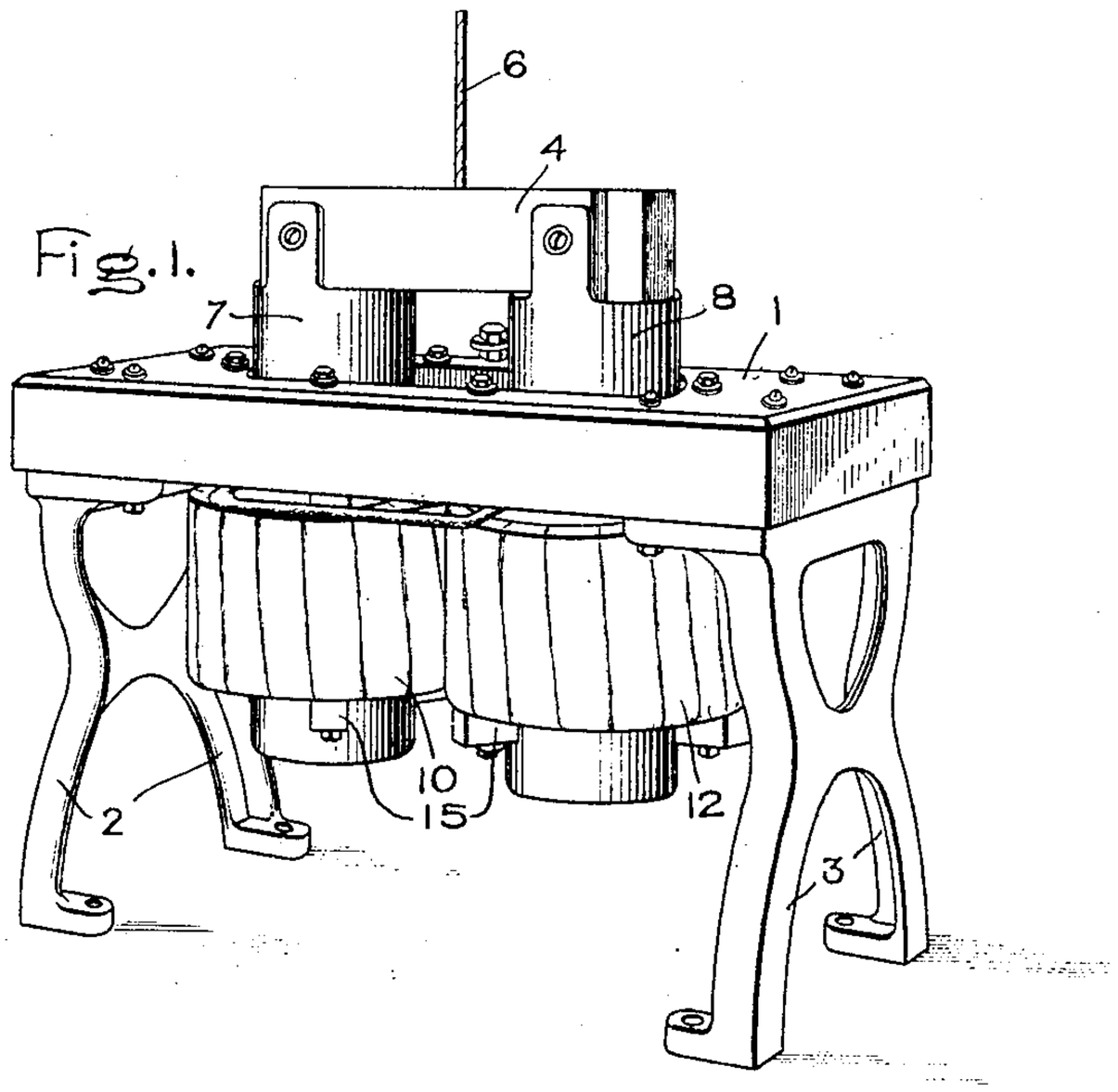
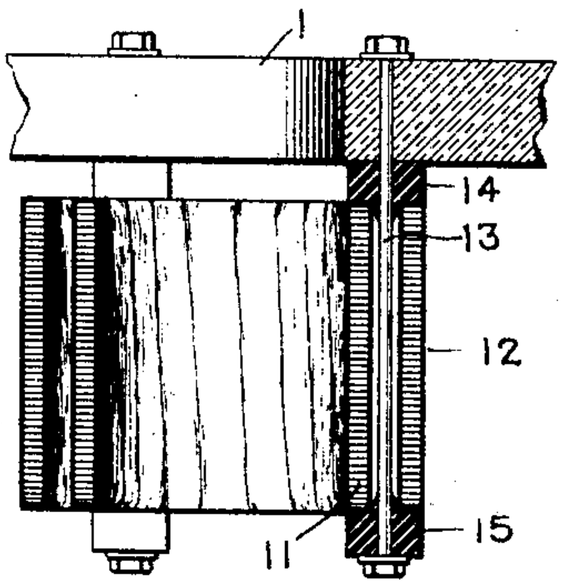
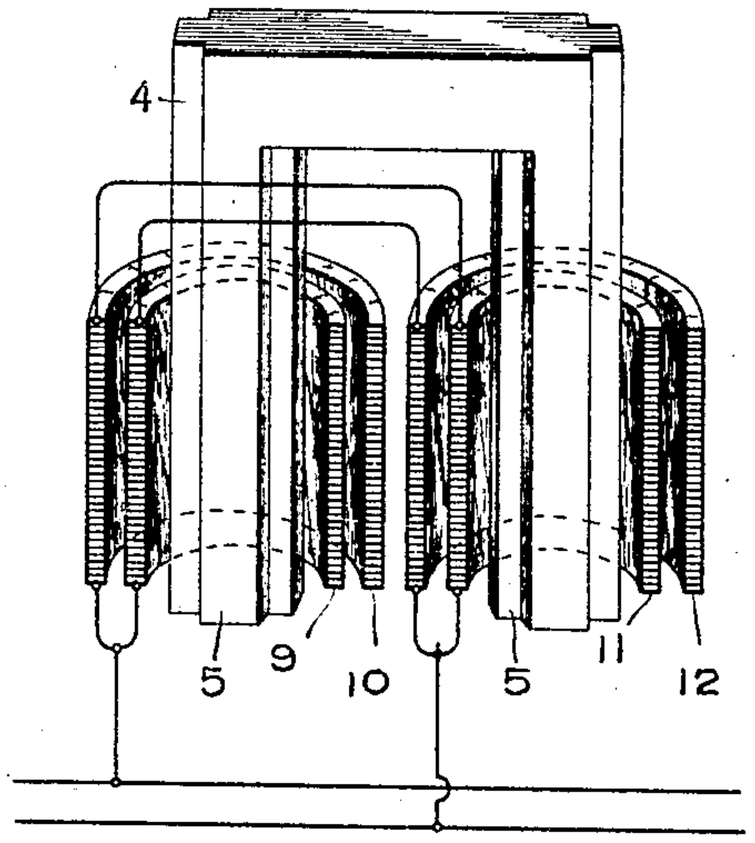


Fig. 3.

Fig. 2.





Witnesses:
George A. Thornton,
Helen Orford

Inventor:
John J. Frank,
by Albert G. Davis
Atty.

No. 771,237. Patented October 4, 1904.

UNITED STATES PATENT OFFICE.

JOHN J. FRANK, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

REACTANCE-COIL.

SPECIFICATION forming part of Letters Patent No. 771,237, dated October 4, 1904.

Application filed February 2, 1903. Serial No. 141,601. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. FRANK, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Reactance-Coils, of which the following is a specification.

My present invention relates to certain improvements in connection with the windings of reactance-coils and comprises certain novel features which I have pointed out with particularity in the appended claims.

The invention itself will be better understood by reference to the following specification, which is to be taken in connection with the accompanying drawings, in which—

Figure 1 is a perspective view of a reactance-coil built in accordance with my invention; Fig. 2, a view, partly in section, of the coils on one leg of the core of the reactance-coil; and Fig. 3, a view showing the circuits of the reactive coil.

The coils of the apparatus may be mounted in any suitable manner, but in the present instance are supported by means of rods depending from the under side of the slate top 1 of a stand or table, the legs of which are indicated at 2 and 3. The core of the reactance device is indicated at 4 and is formed of laminated iron arranged in U shape, the cruciform cross-section of the core being perhaps best illustrated at 5 in Fig. 3. This core is arranged to be raised and lowered in the coils by means of a cord or rope 6, and in order to prevent abrasion of the coils by the sharp edges of the core I provide the legs of the latter with smooth cylindrical sleeves 7 8 of fiber or other suitable non-conducting material. Each leg of the core 4 moves into and out of two concentrically-arranged coils, as represented at 9 10 and 11 12 in Fig. 3, the outer coils 10 and 12 being shown also in perspective in Fig. 1. By providing two coils for each leg of the core, these coils being separated by an air-space, as indicated, I secure a large radiating-surface, thereby permitting the ready dispersion of heat generated in the windings. The manner of supporting these coils is indicated in Fig. 2, which shows at 13 one of the plurality of supporting-rods which extend down through the space between the coils 11 12 and which serve to clamp the coils in place between the insulating-blocks, such as at 14 and 15, located, respectively, at the upper and lower edges of the coils. By subdividing the coils, as shown, in addition to reducing the heating thereof I find that I may obtain an important advantage, when it is desired, for the purpose of varying the reactance that one-half the coils should be placed in multiple with the other half. Instead of connecting the coils on each leg in series with each other and then multiply, connecting the series-connected coils on one leg with the series-connected coils on the other, I make use of a different system of connections, the outside coil on one leg, such as 10, being connected in series with the inside coil 11 on the other leg, the remaining coils being also connected in series with each other and the two pairs or sets of series-connected coils then in multiple with each other, as shown. This cross connection of the two sections of the coils on the two legs of the core 5 distributes or equalizes the effect of any inequality of reactance of the two multiply-connected circuits, due either to slight irregularities in the coils and the positions of the coils relatively to each other and also due to any unsymmetrical relation, slight though it may be, between the core of the apparatus and its respective sets of coils. An equal division of current between the two multiply-connected circuits is thus insured, thus preventing the overload and possible injury or burn-out which might otherwise take place if one coil or set of coils were to take more than its share of the total current. The amount of reactance may be varied by adjusting the core and also by changing the connections of the coils.

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

1. In a reactance device, the combination of a movable core, two concentric coils for each of two legs of said core, and cross connections between the coils such that the inner coil on each leg of the core is in series with the outer coil on the other leg of the core, the two sets

of series-connected coils being connected in multiple with each other.

2. In a reactance device, the combination of a core, two pairs or sets of concentrically-located coils mounted so as to embrace different portions of said core, and multiple connections for said coils such that each branch of the circuit includes an inner coil of one of the sets of coils and an outer coil of the other set.

3. In a reactance device, the combination of a core, and sets of coils relatively movable with respect to said core, one set of coils being located on said core at a distance from the other set of coils, and conductors cross-connecting the coils of said sets in multiple.

In witness whereof I have hereunto set my hand this 31st day of January, 1903.

JOHN J. FRANK.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.