S. E. JOHANNESEN.

TRANSFORMER.

APPLICATION FILED JUNE 21, 1913.

1,159,226.

Patented Nov. 2, 1915.

Fig. 1.

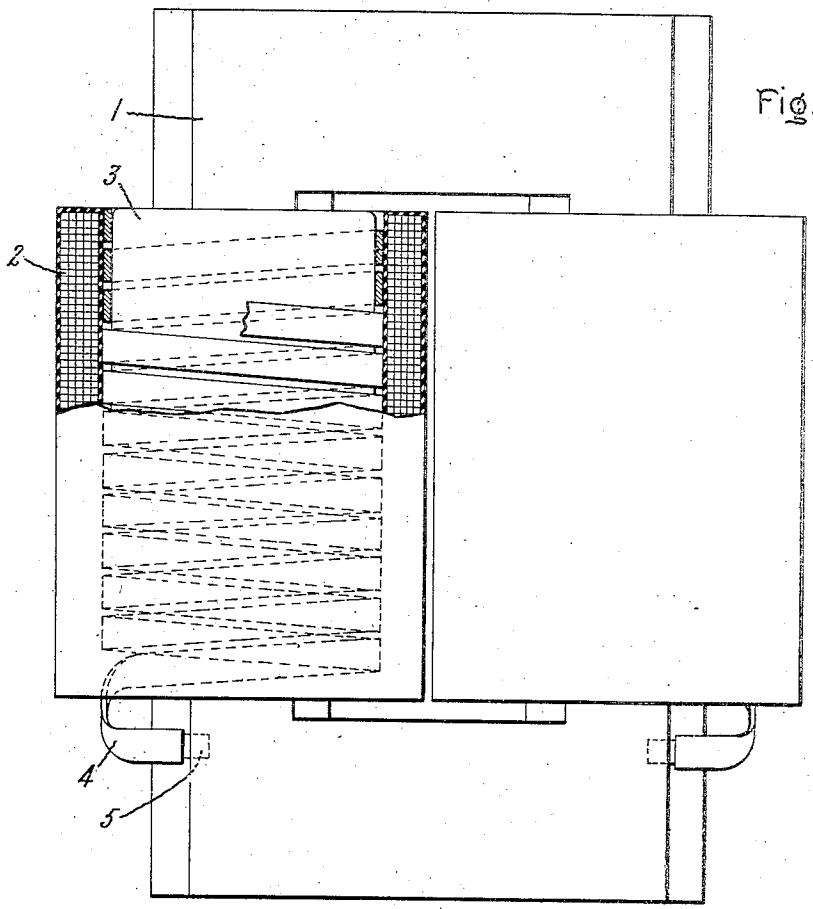
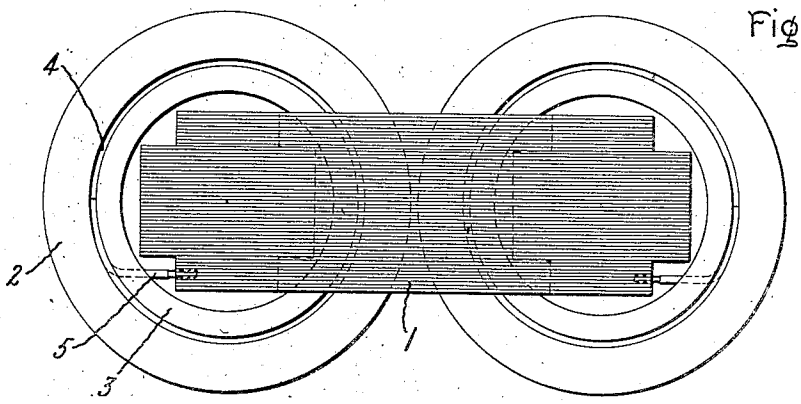


Fig. 2.



WITNESSES:

J. Earl Ryan.

J. Ellis Glen.

INVENTOR:

SVEND E. JOHANNESEN,

BY Albert G. Davis

HIS ATTORNEY.

UNITED STATES PATENT OFFICE.

SVEND E. JOHANNESEN, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TRANSFORMER.

1,159,226. Specification of Letters Patent. Patented Nov. 2, 1915.

Application filed June 21, 1913. Serial No. 775,003.

To all whom it may concern:

Be it known that I, SVEND E. JOHANNESEN, a citizen of the United States, residing at Pittsfield, county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Transformers, of which the following is a specification.

This invention relates to transformers, and particularly to such as are used for high tension work and in which it is desired to have a high reactance.

Heretofore high reactance transformers have been made by placing a magnetic shunt of laminated iron strips between the primary and secondary windings, the strips extending in the general direction of and forming a path for the leakage flux. This arrangement has not proven entirely satisfactory owing to the difficulty of anchoring the strips with sufficient rigidity to withstand the mechanical stresses to which they are subjected in case of an overload and to the fact that the design does not give a straight line reactance from no load to full load.

By the present invention it is proposed to make this magnetic shunt preferably in the form of a flat iron strip wound in the form of a spiral on one of the coils. It has been found that such a structure gives practically a straight line reactance from zero to a load considerably above normal and that the mechanical difficulties experienced with former designs are overcome.

Referring to the drawing Figure 1 is a view partially in section illustrating more or less diagrammatically the preferred embodiment of my invention. Fig. 2 is a section of Fig. 1.

In the drawings 1 is the core of an ordinary type of transformer having wound thereon the primary winding 2 and the secondary winding 3. Between these windings is located the magnetic shunt member 4. This member is made up of one or more flat strips of iron the strands or strips suitably insulated from each other and wound in the form of a spiral directly on the secondary winding. One end of this strip is shown at 5, being grounded on the core of the transformer. By being thus grounded on the core the magnetic shunt between the two windings has the additional advantage of acting as an electric shield, in a fashion distributing the strains between each winding and ground, the core being normally at ground potential, and receiving and conducting to ground the discharges from either coil, thus saving the other coil from injury.

The design of this transformer is a flexible one, readily adaptable to give a long range of reactance values for a given line of transformers; using the same stock various degrees of reactance may be obtained in different transformers by changing the pitch of the spiral of the shunt to thereby vary the distance between adjacent turns.

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

1. In a transformer, the combination of a primary winding, a secondary winding and a spirally wound member forming a magnetic shunt for each winding from the other associated with said windings.

2. In a transformer, the combination of a primary winding, a secondary winding, and a spirally wound member forming a magnetic shunt for each winding from the other and located between said windings.

3. In a transformer, the combination of a core, a primary winding and a secondary winding thereon and a spirally wound member forming a magnetic shunt for each winding from the other and located between said windings, one end of said spirally wound member being grounded on said core.

4. In a transformer, the combination of a cylindrical primary winding, a cylindrical secondary winding, the windings being located one within the other, and a member of magnetic material wound spirally about the inner of said cylindrical windings and between the windings.

5. In a transformer, the combination of a primary winding, a secondary winding, and a magnetic shunt for each of the windings from the other located between said windings and comprising a plurality of portions extending substantially perpendicularly to the direction of the leakage flux and spaced apart in the direction of the leakage flux.

In witness whereof, I have hereunto set my hand this 18th day of June 1913.

SVEND E. JOHANNESEN.

Witnesses:

L. F. KNOLLMEYER,

C. E. LEE.