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1,652,203

H. H. IDE
TRANSFORMER

Filed June 5, 1924

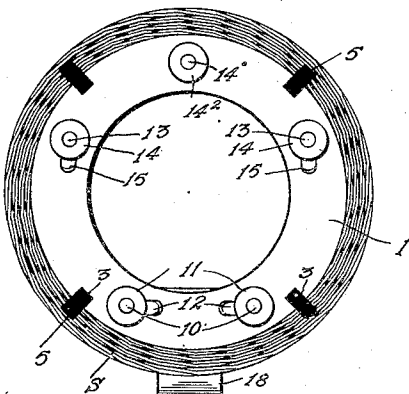


Fig. 1.

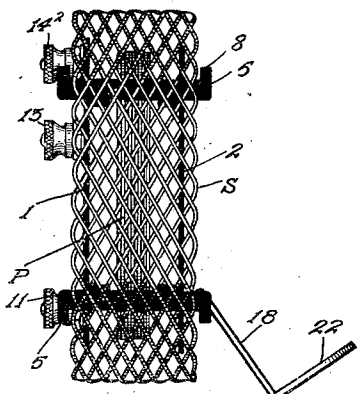


Fig. 2.

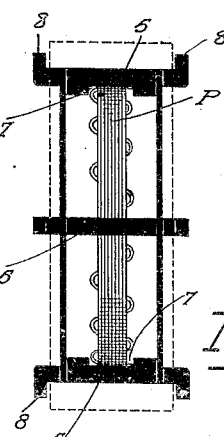


Fig. 3.

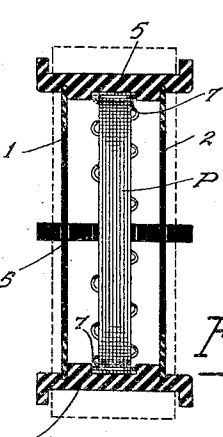


Fig. 4.

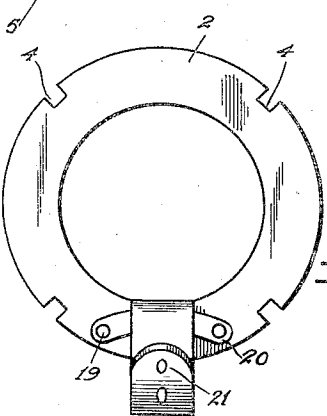


Fig. 5.

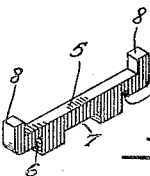


Fig. 6.

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UNITED STATES PATENT OFFICE.

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TRANSFORMER.

Application filed June 5, 1924. Serial No. 717,972.

My invention relates to transformers and more particularly to the type such as are used in the circuits of radio receiving sets.

An object of my invention is the production of a transformer of the above type which is simple in construction, efficient in its operation, and inexpensive to produce.

A feature of my invention is the provision of simple supporting means for supporting the primary and secondary winding of my transformer in such a manner that the capacity and the leakage is reduced to a minimum.

Another feature of my invention is the manner in which the supporting means of my transformer are assembled and held in assembled position by the primary and secondary windings of my transformer.

The above features, as well as others, will be more specifically pointed out in the ensuing specification and appended claims, and for a clearer understanding of my invention reference may be had to the accompanying drawings in which like reference characters in the several views denote like parts.

Referring to the drawing:

Fig. 1 is a front plan view of the transformer or coupler of my invention;

Fig. 2 is a right side view of Fig. 1;

Fig. 3 is a side plan view of my transformer or coupler showing the supporting means and primary winding in assembled position;

Fig. 4 is a view similar to Fig. 3 but showing certain parts in section;

Fig. 5 is a plan view of one of the supporting ring members of my invention showing a mounting bracket secured thereto; and

Fig. 6 is a perspective view of one of the cross bars or bridge members of the supporting means of my invention.

Referring now in detail to my invention as illustrated in the drawings, P is the primary winding of my transformer, while S is the secondary winding which may be diamond wound or of any other suitable type, the said windings being wound into separate coils in the well known manner.

The means of my invention for supporting the primary and secondary windings P and S respectively, comprises a pair of ring members 1 and 2 formed of suitable insulation material, said members 1 and 2 being provided with rectangular slots 3 and 4 respectively. Cross bars or bridge members 5 are

provided, each one of said bridge members 5 having a pair of grooves 6. The groove 6 is of a size to receive one of the ring members 1 or 2. An oblong slot 7 is provided in the member 5 and a pair of ears 8 are also provided and integrally formed with the said member 5. Suitably secured to the ring member 1 is a pair of binding posts 10 having nuts 11 for connecting external conductors to the terminal ends of the primary winding P of my transformer, which terminal ends are soldered to the members 12 secured on the said binding posts; and a pair of binding posts 13 having nuts 14 are also suitably secured to said ring member 1 for connecting external conductors to the ends of the secondary winding S of my transformer, said ends being soldered to the members 15 which are secured on said binding posts 13. A tap binding post 14' having a nut 14", is also secured to the same ring member. Any number of taps may be provided.

Having described the construction of the different parts of my transformer a description of the manner in which the same are assembled will now be given.

The bridge members 5 are placed upon the ring member 1, to which are secured the binding posts, so that one of the grooves 6 of a bridge member 5 will fit over a portion of the said ring member 1 adjacent one of the slots 4, while the bridge member 5 will rest in and engage the said slot 4. When the bridge members 5 are engaging the ring member 1 as just described above, the primary winding coil P is inserted between the bridge members 5 so that the primary winding P will engage and rest in the slots 7 formed in the bridge members 5. The bridge members 5 are now drawn down on the primary coil P and the secondary winding coil S is slipped over the free ends of the bridge members 5 and brought to rest on the bridge members 5 between the ears 8 integrally formed with said bridge members. The bridge members 5 are now forced against the inner circumferential face of the secondary wall S by the spring effect of the primary winding coil P, said coil P being of such a size as to exert pressure on the bridge members to press the same against the inner face of the secondary winding coil S, whereby said coil S rests between the ears 8 and on the said members 5. The other ring member 2

is now placed in assembled position by positioning the said ring member 2 so that the free ends of the bridge members 5 register with the slots 4 in said ring member. By pressing outwardly on the different free ends of the bridge members 5 the ring member 2 may be slipped into the coil S until the grooves 6, in the free ends of the bridge members 5, register with that portion of the ring member 2 adjacent the slots 4, whereupon the said portions will engage said grooves 6 and the bridge members will rest in the said slots 4. There is enough flexibility to the coil S to maintain the bridge members 5 in engagement with the ring members 1 and 2, and there is also enough flexibility to the primary coil P to maintain the bridge members 5 in engagement with the secondary coil S. Thus it will be seen that the bridge members 5 are supported on the members 1 and 2 and that said bridge members support and separate the primary and secondary coils P and S respectively, and it will be further seen that the bridge members 5 are held in engagement with the ring members 1 and 2 and the coils P and S by said coils P and S. It will also be readily apparent that the coils P and S will retain their circular shape and be prevented from sagging by the ring members 1 and 2 and the bridge members 5, the periphery of the ring members 1 and 2 engaging the inner wall of the coil S.

The ends of the primary winding P extend through suitable orifices in the ring member 1 and are then soldered to the conducting members 12 secured to the binding posts 10. The ends of the secondary winding S are soldered to the conducting members 15 secured to the binding posts 13.

To disassemble my transformer the same may be accomplished by pressing outwardly on the ends of the bridge members 5, engaging the ring member 2, to clear the said ring member from the grooves 6 whereupon the ring member 2 may be removed, and then by pressing outwardly on the other ends of the bridge members to clear the member 1 from the grooves 6 whereupon the ring member 1 may be removed.

For mounting my transformer as a unit in position a bracket 18 is provided which is secured to the ring member 2 by suitable rivets 19 which engage suitable openings in said ring member 2 and openings in the arms 20 integrally formed with the said bracket 18. Openings 21 are provided in the free end 22 of the bracket 18 for receiving suitable means to secure said bracket to any suitable mounting panel or board.

From the foregoing it will be obvious that I have provided a transformer or coupler whose primary winding and secondary winding are mounted and associated in position in such a manner that said windings have a

very small amount of contactual engagement with other members, whereby the loss by leakage is reduced to a minimum.

While I have described a preferred embodiment of my invention, it is to be understood that I do not wish to be limited to the exact structure as shown and described, but that I intend to cover all that which may come within the spirit and scope of the appended claims.

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

1. A device of the class described including a pair of self-maintained windings, supporting means forming annular channels for supporting and separating said pair of windings to form an air core transformer, said windings exerting stress upon said supporting means to hold the same in assembled position, one of said windings exerting stress to prevent displacement of said supporting means inwardly and the other to prevent displacement of said means outwardly.

2. A device of the class described including a pair of self-maintained coils, supporting means forming annular channels comprising a plurality of members for supporting and separating said coils in operative position to form an air core transformer, said coils exerting stress upon said supporting means to maintain them in their assembled position, one of said windings exerting stress to prevent displacement of said supporting means inwardly and the other to prevent displacement of said means outwardly.

3. A device of the class described including a pair of coils, a pair of ring members provided with notches, non-conducting members provided with grooves for receiving said ring members, said non-conducting members engaging said notches whereby said ring members are bridged together, said coils supported by said non-conducting members and adapted to hold said non-conducting members and said ring members together.

4. A device of the class described including electrical conductors wound to form separate coils, ring shaped non-conducting members provided with notches, a plurality of non-conducting bridge members provided with grooves adapted to register with the notches of said ring shaped members so that said ring shaped members engage the grooves in said bridge members and said bridge members engage the notches in said ring shaped members, said coils supported by said ring shaped members and said bridge members and adapted to secure said members together to form a single mountable unit.

5. A device of the class described including electrical conductors formed into separate

rate coils of different sizes, circular shaped members of a size to fit into the larger size of said coils, non-conducting members uniformly spaced and supported in the peripheral edges of said circular shaped members, the larger size coil of said coils adapted to engage one face of said non-conducting members and the smaller size coil of said coils adapted to engage the opposite face of said non-conducting members, said coils exerting pressure upon said non-conducting members to hold the same in assembled position on said circular shaped members.

6. A device of the class described including a pair of self-maintained coils, one of said coils adapted to fit into the other of said coils, non-conducting members adapted to fit into the larger of said coils, other non-conducting members interposed between said coils and adapted to engage said first non-conducting members, all of said non-conducting members supporting said coils to form an air core transformer, and said coils exerting stress upon said non-conducting members to maintain them in assembled position, one of said coils exerting stress to prevent displacement of said non-conducting members inwardly and the other to prevent displacement of said members outwardly.

7. A device of the class described including a pair of coils, a pair of members, other members supported on said pair of members, means integrally formed with said other members for receiving one of said coils, and means integrally formed with said other members for receiving the other of said coils, said coils separated by said other members and adapted to maintain said pair of members and said other members in assembled position.

8. A device of the class described including a pair of windings formed into separate coils, ring shaped non-conducting members provided with notches, other non-conducting members provided with notches, said ring shaped members adapted to engage the notches of said other non-conducting members, and said other non-conducting members adapted to engage the notches of said ring shaped members, and means formed with said other members for receiving said coils whereby said coils are supported by said members, said other members operable to permit the removal of one or both of said ring shaped members.

9. A device of the class described including a pair of disk members, a plurality of bridging members engaging the peripheral edges of said disk members for bridging said members together, a pair of coils separated and supported by said bridging members, said coils holding said bridging members on said disk members, and terminals secured to one of said disk members for said coils.

10. A device of the class described including a pair of disk members, a plurality of bridging members engaging the peripheral edges of said disk members for bridging said members together, a pair of coils separated and supported by said bridging members, said coils holding said bridging members on said disk members, terminals secured to one of said disk members for said coils, and mounting means secured to the other of said disk members for mounting said device in position.

Signed by me at Chicago, county of Cook and State of Illinois, this 3rd day of June, 1924.

HARRY H. IDE.