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TRANSFORMER

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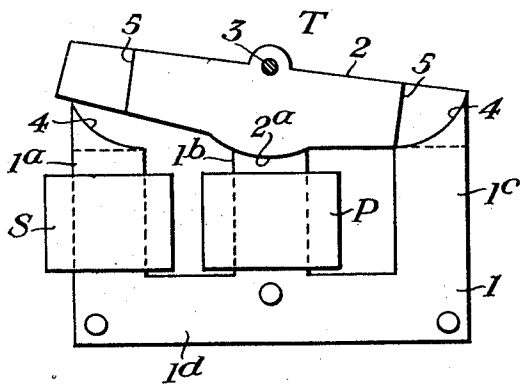


Fig. 1.

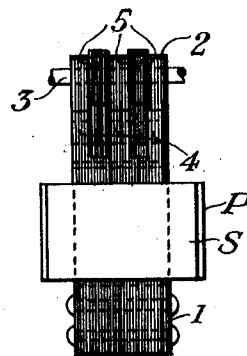


Fig. 2.

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TRANSFORMER

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1 Claim. (Cl. 171-119)

My invention relates to transformers, and particularly to reactive transformers having an adjustable equivalent reactance.

One object of my invention is the provision, in a transformer of the type described, of novel means for adjusting the equivalent reactance of the transformer, whereby the range of adjustment of the transformer is increased and a continuous adjustment is provided between the maximum and minimum reactance.

I will describe one form of transformers embodying my invention, and will then point out the novel features thereof in the claim.

In the accompanying drawing, Figs. 1 and 2 are front elevational and left-hand end views, respectively, showing one form of transformer embodying my invention.

Similar reference characters refer to similar parts in both views.

Referring to the drawing, the transformer here illustrated, which transformer is designated as a whole by the reference character T, comprises a stationary laminated core member 1 of magnetizable material having three vertically extending spaced parallel legs 1^a, 1^b, and 1^c connected at their lower ends by a backstrap 1^d, and a movable laminated core member 2 also of magnetizable material, which is pivotally supported above the middle leg 1^b of the stationary core member 1 at point 3, for swinging movement toward and away from the outer legs 1^a and 1^c of the stationary core member 1. The upper end of the middle leg 1^b of the stationary core member 1 is rounded in the manner shown in Fig. 1, and the movable core member is provided with a rounded depending portion 2^a which extends into, and cooperates with, the rounded portion on the movable core member in such manner that the reluctance of the flux path from the middle leg 1^b to the movable core member will be as small as possible, and will remain constant in all positions of the movable core member relative to the stationary core member. Furthermore, the upper ends of the legs 1^a and 1^c are each provided with a plurality of vertically extending spaced parallel tongues 4 having rounded upper surfaces that slope downwardly and inwardly, which tongues cooperate with mating slots 5 formed in the adjacent end of the movable core member in such manner that rotation of the movable core member about the pivot pin 3 between its two extreme positions will produce gradual changes in opposite directions in the reluctance of the two parallel flux paths formed by the stationary and movable core members. The middle leg 1^b

of the stationary core member 1 is surrounded by a primary winding P, and the outer leg 1^a is surrounded by a secondary winding S.

With the transformer constructed in the manner just described, it will be apparent that two parallel flux paths are provided for the flux which is set up by the primary winding P when this winding is energized, one of which paths passes through the secondary winding S and includes the left-hand half of the backstrap 1^d as viewed in Fig. 1, the leg 1^a, and the left-hand end of the movable core member 2, and the other of which paths is a leakage path and includes the right-hand half of the backstrap 1^d, as viewed in Fig. 1, the leg 1^c, and the right-hand end of the movable core member 2. It will also be apparent that the flux which is set up in the core by the energization of the primary winding P will divide between the two flux paths just traced in proportion to the relative reluctances of these paths. The parts are so proportioned that when the movable core member occupies the extreme position in which it is shown in the drawing, the leakage path will have a relatively low reluctance and the path through the secondary winding will have a relatively high reluctance, whereas when the movable core member occupies its other extreme position, the leakage path will then have a relatively high reluctance and the path through the secondary winding will have a relatively low reluctance. It follows, therefore, that when the movable core member occupies the extreme position in which it is shown in the drawing, substantially all of the magnetic flux from the primary winding will traverse the leakage path, and under these conditions, the secondary winding will have its maximum reactance, and the voltage regulation of the transformer will be substantially the same as that of a constant potential transformer with maximum reactance in series with the secondary winding. When, however, the movable core member occupies its other extreme position, substantially all of the magnetic flux from the primary winding will then traverse the path through the secondary winding, and under these conditions, the secondary winding will have its minimum reactance, and the voltage regulation of the transformer will approach that of a constant potential transformer. It will readily be understood that by rotating the movable core member between its two extreme positions, the reluctances of the two flux paths, may be gradually varied between their maximum and minimum values, and that, as the reluctance of the one path increases, the reluctance of the other

path will simultaneously decrease, and it is evident, therefore, that by changing the position of the movable core member 2, the equivalent reactance of the secondary winding S may be varied
5 by infinitely small amounts to give any desired value between its maximum and minimum equivalent reactance.

Although I have herein shown and described only one form of transformers embodying my invention, it is understood that various changes and
10 modifications may be made therein within the scope of the appended claim without departing from the spirit and scope of my invention.

Having thus described my invention, what I
15 claim is:

A reactive transformer comprising a stationary core member provided with a middle and two
outer vertically extending parallel legs connected
together at their lower ends by a backstrap, said
20 middle leg being provided at its upper end with a

curved surface and said two outer legs each being provided at its upper end with a plurality of vertically extending spaced parallel tongues the upper surfaces of which slope downwardly and inwardly, a movable core member pivotally supported intermediate its ends directly above said middle leg for swinging movement toward one or the other of said outer legs, said movable core member being provided with a rounded depending portion which cooperates with the rounded
10 upper end of said middle leg to provide a low reluctance connection between said middle leg and said movable core member in all positions of said movable core member, and said movable core member being further provided at each end with
15 slots which cooperate with the tongues on the outer legs of said stationary core member, a primary winding on said middle leg, and a secondary winding on one of said outer legs.

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