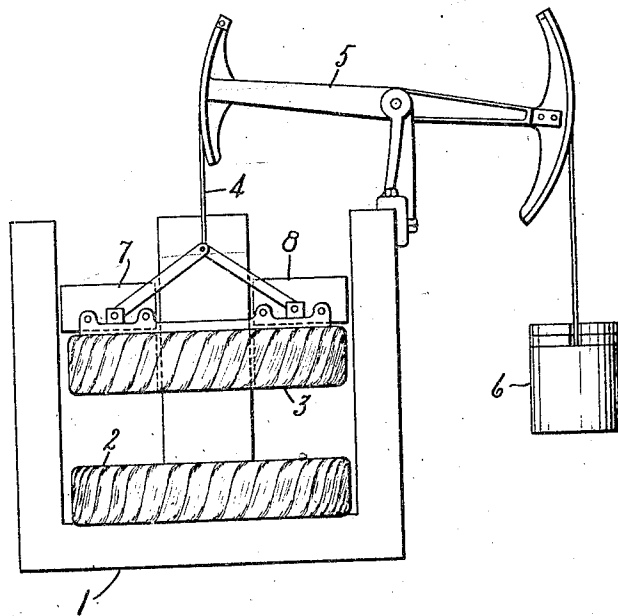


M. O. TROY.
TRANSFORMER.
APPLICATION FILED APR. 23, 1908.

1,021,221.

Patented Mar. 26, 1912.



Witnesses
J. Earl Ryan
J. Elbi Elen

Inventor
Matthew O. Troy
by *Albion Davis*
Atty.

UNITED STATES PATENT OFFICE.

MATTHEW O. TROY, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TRANSFORMER.

1,021,221.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed April 28, 1908. Serial No. 429,643.

To all whom it may concern:

Be it known that I, MATTHEW O. TROY, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Transformers, of which the following is a specification.

My invention relates to transformers, and more particularly to transformers which are used for constant alternating-current electric circuits, and has for its object an improvement in the construction of such transformers. These transformers have commonly been constructed in the past with a stationary coil and a movable coil both influencing a magnetic core which is so arranged that there is a constant length of path for the magnetic circuit, regardless of the position of the moving coil. This means that at full-load, when the two coils are close together, the primary winding will have to magnetize a portion of the core longer than is required for influencing the secondary winding, and hence, a greater core-loss than needful is taken by the transformer.

An object of my invention is to decrease this excessive core-loss which occurs during full-load, which is practically the normal operating condition for these transformers.

Another object of my invention is to decrease that portion of the magnetic circuit not required for purposes of transformation, but inserted merely to give reactance, and thus to obtain one of the great advantages of a system consisting of a constant potential transformer and a separate regulating constant-current reactive-coil.

For a further understanding of my invention, reference may be had to the accompanying drawing, wherein the single figure illustrates in elevation an embodiment of my invention.

1 is an E-shaped magnetic core having three upright legs and a bottom portion joining the three legs.

2 and 3 are coils surrounding the central leg of the core, coil 2 being shown as stationary, and coil 3 as movable in the well known fashion; one of the coils being the primary and the other the secondary of the transformer. The movable coil 3 is fastened in the usual way to a cord 4, which is fastened to one end of a lever 5, the other end of which has attached to it by another cord a counter-balancing weight 6 for partially

counter-balancing the weight of the movable coil 3 for the purposes well understood by those skilled in the art.

Attached to the movable coil 3, I have shown two magnetic members 7 and 8, which move between the legs of the core, and form a closed magnetic circuit around the movable coil. These movable magnetic members 7 and 8 move with the movable coil, and hence, for a full-load condition of the transformer when the two coils are in close proximity, the upper portions of the legs of the core above these two movable members will have substantially no magnetic flux passing through them, since the reluctance of the closed circuit formed by members 7 and 8 will be so much less than the reluctance of the shunt circuit which is formed by the upper portion of the legs of the core and the air-gaps between them. This will mean, then, that there will be substantially no core-loss in that portion of the transformer core not subjected to the magnetic flux, and hence the efficiency of the transformer will be increased. The portion of the magnetic circuit also, that is not required for transformation purposes, but which is merely inserted to give reactance, is then idle, and only consumes energy when it is required to do so.

While I have shown one form in which my invention may be carried out, I do not limit myself to this form, but seek in the appended claims to cover all those forms in which my invention may be carried out, and which do not depart from the scope of my invention.

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

1. In a constant current transformer, a magnetic core, a stationary and a movable coil surrounding a portion of said core and in inductive relation to each other so that the core forms a magnetic circuit for the coils, and means for varying the reluctance of the magnetic circuit inversely with the transformer load.

2. In a constant current transformer, a magnetic core, a stationary and a movable coil surrounding a portion of said core and in inductive relation to each other so that the core forms a magnetic circuit for the coils, and means for varying the length of the magnetic circuit inversely with the transformer load.

3. In a constant current transformer, a magnetic core, a stationary and a movable coil surrounding a portion of said core and in inductive relation to each other so that
5 the core forms a magnetic circuit for the coils, and means for decreasing the leakage flux of the movable coil for an increasing load on the transformer.
4. In a constant current transformer, a
10 magnetic core, a stationary and a movable coil surrounding a portion of said core and in inductive relation to each other so that the core forms a magnetic circuit for the
15 coils, and means for decreasing the core loss for an increasing load.
5. In a constant-current transformer, a stationary coil, a movable coil, a core and a movable magnetic member decreasing the
20 length of the magnetic circuit for an increased transformer load.
6. In a constant-current transformer, an E-shaped core, a stationary coil surrounding the central leg of said core, a movable coil
25 surrounding the central leg of the core, and movable magnetic members movable longitudinally between the legs of the core.
7. In a constant-current transformer, an E-shaped core, stationary and movable coils
surrounding the central leg of said core and magnetic members movable longitudinally
30 between the legs of the core closing the magnetic circuit around the movable coil.
8. In a constant-current transformer, an E-shaped core, a stationary and a movable
35 coil surrounding the central leg of the core and magnetic members fastened to the movable coil closing the magnetic circuit between the legs of the core around the movable
40 coil.
9. In a constant-current transformer, an E-shaped core, a stationary and a movable
45 coil surrounding the central leg of the core, magnetic members fastened to the movable coil closing the magnetic circuit between the legs of the core around the movable coil, and means for counter-balancing the weight
of the core and the movable magnetic members.
- In witness whereof, I have hereunto set
my hand this 27th day of April, 1908.
MATTHEW O. TROY.
- Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.