I. E. ASKE.

VARIABLE MAGNETIC OPPOSED REACTION COIL ELECTRIC CIRCUIT.

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1,220,166.

Patented Mar. 27, 1917.

Fig. 1.

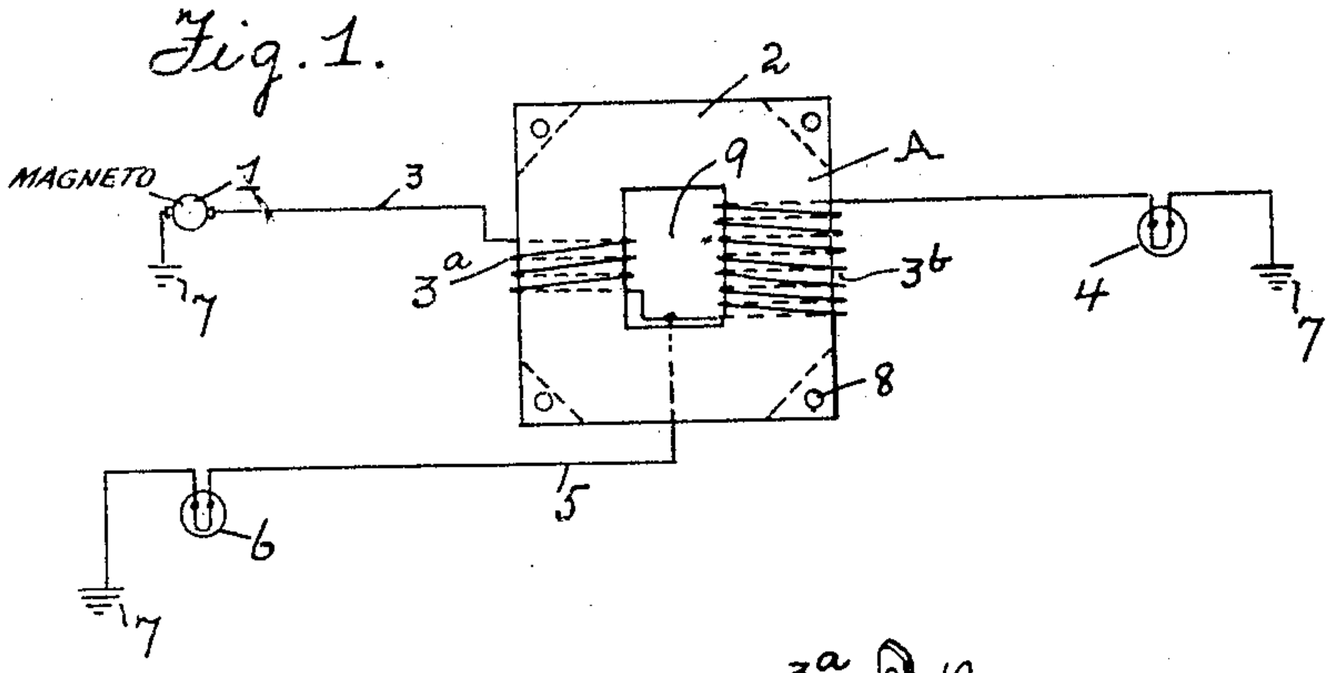


Fig. 2.

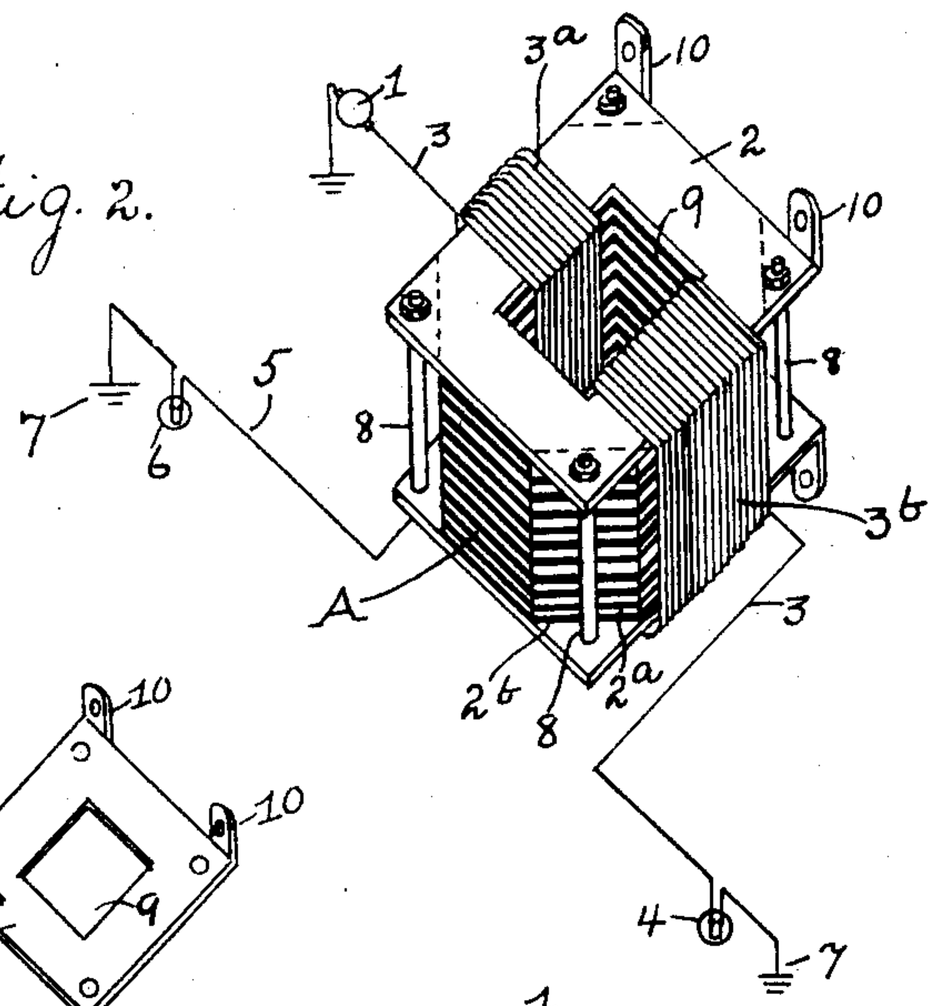


Fig. 3.

Fig. 4.

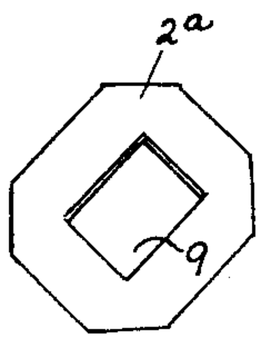
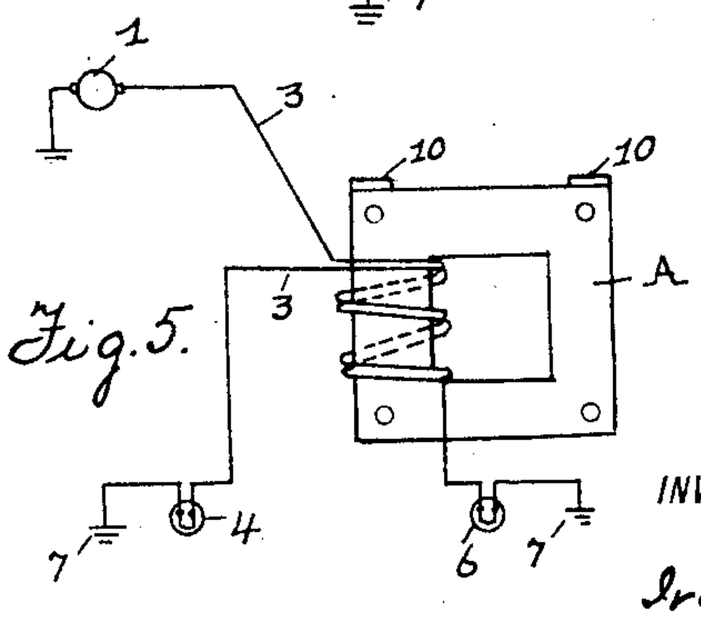


Fig. 5.



WITNESSES:

Charles L. Olson

Pearl Gould Denham

INVENTOR

Irving E. Aske

BY

James T. Watson

His ATTORNEY

UNITED STATES PATENT OFFICE.

IRVING E. ASKE, OF DULUTH, MINNESOTA, ASSIGNOR TO ASKE AUTOMATIC VOLTAGE REGULATOR COMPANY, A CORPORATION OF DELAWARE.

VARIABLE MAGNETIC-OPPOSED REACTION-COIL ELECTRIC CIRCUIT.

1,220,166. Specification of Letters Patent. Patented Mar. 27, 1917.

Application filed June 11, 1915. Serial No. 33,511.

To all whom it may concern:

Be it known that I, IRVING E. ASKE, a citizen of the United States, residing at Duluth, in the county of St. Louis and State of Minnesota, have invented certain new and useful Improvements in Variable Magnetic-Opposed Reaction-Coil Electric Circuits, of which I do hereby declare the following to be a specification.

My invention relates to variable magnetic-opposed reaction-coil electric circuits and has for its object the provision of means for electrically operating a plurality of mechanisms or translation devices simultaneously or any of them separately in which operating means the current flow to each such mechanism will be automatically controlled or governed.

Under the former system of magneto electric lighting of certain automobile head lights, a great range of voltage variation existed, extending from 6 to 18 volts, which necessitated the use of high voltage lamps in parallel operation, or of low voltage lamps connected in series. In both these systems the efficiency of the lamps is very low when the magneto is running slow. This is a very undesirable condition, since it is when the vehicle is running slow as over bad roads that the greatest amount of light is needed. Another disadvantage of series lighting is that when one lamp goes out, the whole series is extinguished. By employing my invention both these disadvantages may be avoided. By connecting low voltage lamps in parallel in accordance with my invention for controlling them a nearly constant intensity of light can be maintained.

In the drawings Figure 1 is a diagrammatic view of one form of my said invention. Fig. 2, is a perspective view of the preferred form of a reactance coil and core forming part of my said invention. Fig. 3, is a plan view of the top plate forming part of said core. Fig. 4 is a plan view of an intermediate plate forming part of said core and Fig. 5 is a diagrammatic view of a modified form of my said invention.

Referring to the drawings, my invention embodies a suitable source of electricity as a magneto 1; a magnet core A, preferably composed of a plurality of superposed plates as 2, 2^a insulated from each other by any suitable interposed insulating material as at 2^b; an electric conductor 3 connected at one terminal with one of the poles of said source of electricity and preferably wound in a continuous direction of rotation in two electrically serial, mechanically parallel coils as 3^a, 3^b, upon said core, the opposite end of said conductor being electrically connected to a mechanism or translation device to be operated, as to a lamp 4; a branch electric conductor 5, electrically connected at one end between said two coils to the first said conductor, and electrically connected at its opposite end to a mechanism or translation device to be operated, as to a lamp 6. The circuit may be completed between said translation devices and the opposite pole of said source by means of any suitable artificial or metallic conductor (not shown), or by grounding said opposite pole and one side of each of said translation devices, as at 7, 7, 7. The turns of the core windings in each coil are insulated from each other and from the core in any suitable manner or by any suitable insulating material. The several plates embodied in said preferred form of core, are preferably stamped from thin soft iron sheets, the top and bottom plates preferably extending at the corners slightly beyond the intermediate plates to form lips for engaging the clamping bolts 8 by which the pile of plates is held together so as to form a unitary structure. Each of said plates has formed therein a central aperture 9 for the passage of one side of each of said coils. Upon one of the walls of said core one of said coils is wound, and upon the opposite wall of said core the other of said coils is preferably wound, a greater number, preferably twice as many turns of wire or conductor preferably being given to the coil 3^b than to the coil 3^a. The top and bottom plates are preferably provided with ears, as 10 by means of which the core may be secured to a suitable support. If desired, the

two coils may within the scope of my invention and of certain of my claims be concentrically wound in opposite directions upon one wall of said core as shown in Fig. 5, with approximately the same result as if respectively wound in the same direction of rotation on different walls of said core.

The operation of my invention depends on an alternating current of electricity, and on a variable magnetic field density produced in said core by a varying electric current traveling through the first coil 3^a. At the point of junction of the conductor 3 and the branch conductor 5, the current divides, part of it flowing to the mechanism or lamp 4, and part of it flowing to the mechanism or lamp 6, the amount of current flowing through the coil 3^a being the sum of the amount flowing through the lamps 4 and 6. The winding of both coils in the same direction of rotation on opposite walls of said core, or in opposite directions on one of said walls, produces in the core magnetic poles of like polarity. In operating electric lights in parallel by an alternating current, it was, prior to my invention often found impossible to operate the lights independently of each other, since when one lamp was extinguished the voltage increased, causing said other to burn out. To avoid this condition and to secure the maintenance of an approximately constant voltage at the lamps, whether one or more of the lamps is in operation, is one of the objects of my invention. In my invention, the magnetic flux generated by one coil is, when current is flowing through both coils, opposed by the flux generated by the other coil, thus causing the magnetic flux of both coils to thread or flow through the central aperture 9, and through the surrounding air medium. The choking effect of either coil is then substantially neutralized by that of the other. When one lamp is extinguished the voltage increases and tends to force a greater current through the other lamp, to prevent which a percentage of unneutralized flux is required.

If the lamp 4 should be extinguished, the magnetic opposition previously produced by the current flowing through coil 3^b will cease, and as a result the magnetic flux produced by coil 3^a will thread or flow through the iron core which has a lower reluctance than the air medium through which it previously flowed. Thus the magnetic flux will flow in greater strength or volume (even though the ampere turns of the coil 3^a are less than when carrying current for the coil 3^b), and will cause a greater choking effect in the coil 3^a, therefore, and because the flux is not neutralized by opposing flux, the higher voltage is prevented from forcing an excessive current through the coil 3^a and lamp 6. If, on the other hand, the lamp 6 is extinguished and the lamp 4 continues in circuit, said lamp 4 will continue to burn approximately as when both lamps were in circuit; because although there is then magnetic opposition between the coils, the flux produced by the coil 3^a is only one half its former value, in opposition to the flux generated by coil 3^b; thus the excess or unneutralized flux operates to choke the excessive current which the higher voltage tends to force through the coil 3^b.

If the voltage should be abnormally increased tending to force a heavier current through said lamps, the reaction of both coils increases and tends to choke off such excess current. When such increase of voltage is accompanied by an increase in frequency, a more effective automatic regulation results.

Having now described my invention, what I claim is:—

1. The combination of a source of alternating electric current, a reactance coil comprising a core having two legs connected to each other at each end to form a magnetic circuit, each leg having a coil wound thereon, said coils being wound in the same direction of rotation and connected to each other in series, said coils being connected at one end to one of the poles of said source, a translation device connected at one side with the opposite end of said coils, and a translation device connected at one side to said coils intermediate of the ends thereof, the opposite side of each of said translation devices being electrically connected with the opposite pole of said source.

2. The combination of a source of alternating electric current, two reactance coils connected to each other in series, a core for each of said coils, said cores being laminated and connected together at each end to form a magnetic circuit, said coils being wound upon said cores in such manner as to produce in both of said cores poles of like polarity, the free end of one of said coils being connected to one pole of said source, a translation device connected at one side to the free end of the other of said coils, and a translation device connected at one side to said first coil at a point near the junction of the two coils, the opposite sides of said translation devices being electrically connected with the opposite pole of said source.

3. The combination of a source of alternating electric current, two reactance coils in series, a core common to both of said coils and adapted to form a magnetic circuit, said core including two legs, one of said coils being wound upon one of said legs and the other of said coils being wound upon the other of said legs so as to produce poles of like polarity in both of said legs when both of said coils are charged, a translation de-

vice adapted to receive electric current through only the first coil of said series, a translation device adapted to receive electric current through both of said coils, the second of said coils having a greater number of turns of the electric conductor than the first of said coils.

In testimony whereof, I hereunto affix my signature, in presence of two witnesses.

IRVING E. ASKE.

Witnesses:
GVON SUCCOMIHH
ISAAC N. POWER.