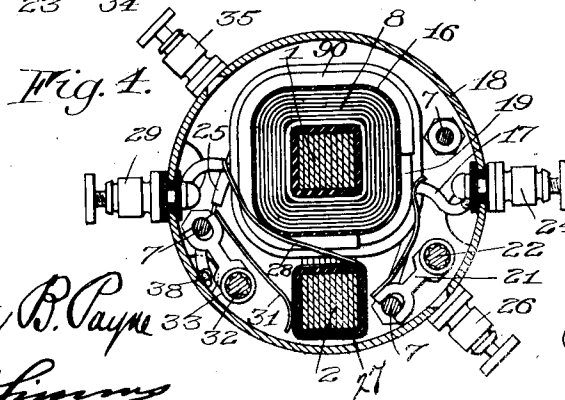
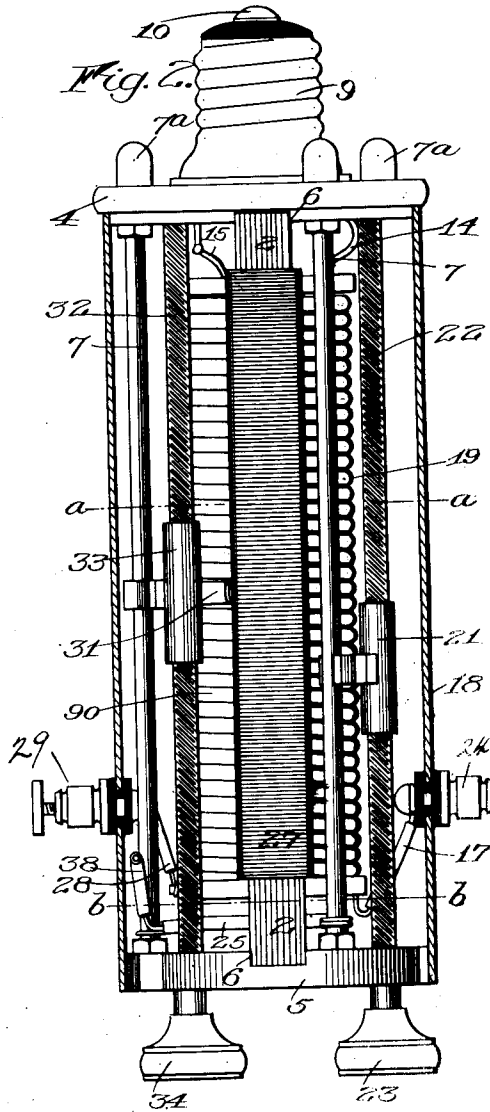
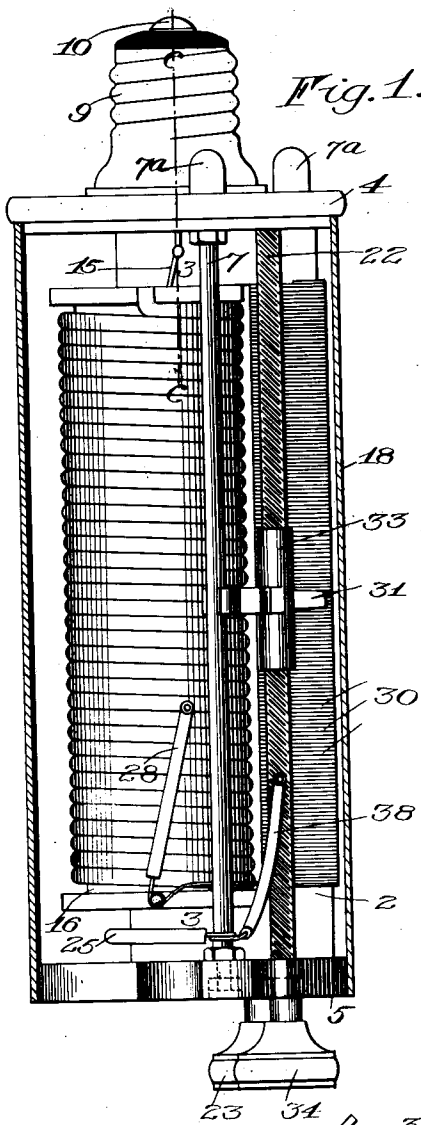


H. A. KEIP.  
ALTERNATING-CURRENT TRANSFORMER.  
APPLICATION FILED OCT. 1, 1908.

Patented Apr. 12, 1910.

2 SHEETS—SHEET 1.

954,518.



Witnesses

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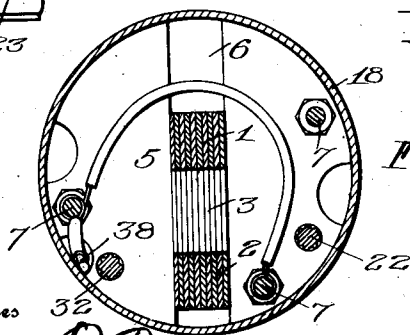
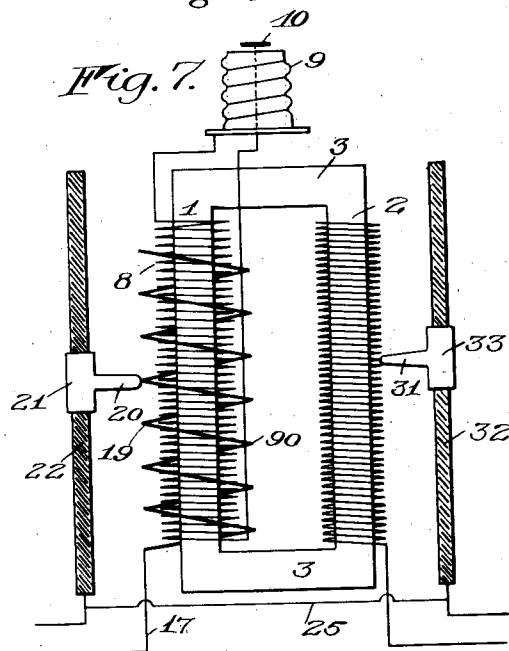
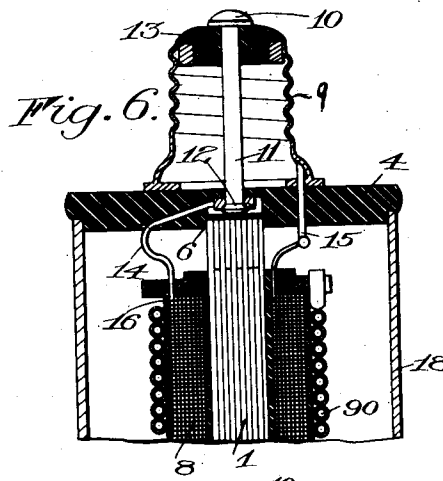
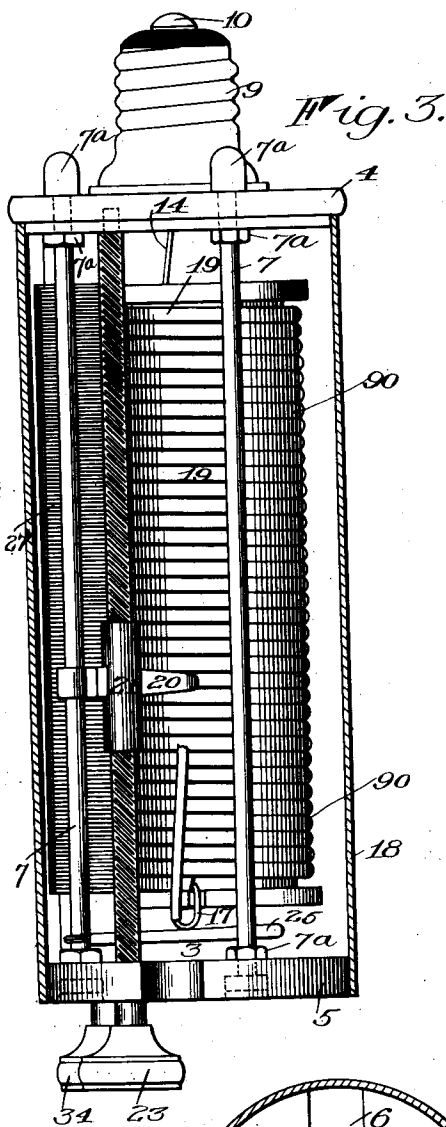


Fig. 5.

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# UNITED STATES PATENT OFFICE.

HERMAN A. KEIP, OF ROCHESTER, NEW YORK, ASSIGNOR TO ELECTRO SURGICAL INSTRUMENT COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

## ALTERNATING-CURRENT TRANSFORMER.

954,518.

Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed October 1, 1908. Serial No. 455,741.

To all whom it may concern:

Be it known that I, HERMAN A. KEIP, of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Alternating-Current Transformers; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the reference-numerals marked thereon.

The present invention relates to alternating current transformers and it has for an object to provide a compact construction adapted for transforming the commercial current used for incandescent lighting into a current that may be employed for medical or other purposes where a different voltage and amperage is desired.

Another object is to provide for the regulation of the changed current to secure a great number of different voltages.

Still another object is to provide a device through which may be obtained either a current of high voltage and low amperage or a current of low voltage and high amperage.

To these and other ends the invention consists in certain improvements and combinations of parts all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings. Figures 1, 2 and 3 are views showing a portion of the casing in vertical section and the other parts in side elevation, each view being shifted relatively to the others; Figs. 4 and 5 are horizontal sections on lines *a-a* and *b-b* respectively of Fig. 2; Fig. 6 is a vertical section on line *c-c* of Fig. 1; and Fig. 7 is a diagrammatic view illustrating the circuits.

The present embodiment of this invention employs a closed magnetic core consisting of a pair of upright portions or legs 1 and 2 and horizontal end portions 3 all of which are laminated. This core is preferably carried by and between two insulators 4 and 5 which are in the form of disks grooved at 6 to receive the horizontal portions 3 of the core, the disks being held to the core preferably by tie rods 7 and nuts 7<sup>a</sup> arranged in pairs at the ends of the rods to engage opposite faces of the disks.

Surrounding the upright 1 of the core is

a primary coil 8 which has its terminal connected to two contacts 9 and 10 arranged on the insulator 4, said contacts in this instance forming part of an electric plug which is rigid relatively to the core in order that the transformer may be supported rigidly from the usual incandescent lamp socket. The contact 9 is externally screw threaded and rests against insulator 4, while contact 10 is formed by the head of a bolt 11 that extends through hollow contact 9 and insulator 4 and has its inner end flattened at 12 so that the insulator 13 and contact 9 are held to insulator 4. To this flattened end of the bolt 11 is secured one terminal 14 of the primary coil and the other terminal 15 is secured to contact 9.

The primary coil is surrounded by a secondary coil 90 and insulated therefrom by a sheet of insulation 16. The diameter of the wire forming the secondary is greater than that of the primary and the secondary also has a fewer number of windings, thus producing a current of low voltage and a high amperage. The terminal 17 of this secondary is connected to a binding post 24 that is secured to and insulated from an open end cylinder 18 which surrounds the core and the coils thereon and engages the insulators 4 and 5 to form therewith a casing for the transformer. The other terminal of the secondary is formed by one of a series of contacts 19 arranged longitudinally of the secondary and formed by removing the insulation from the windings. To cooperate with these contacts in order to reduce the number of windings through which the current shall flow and in this manner to reduce the voltage to the desired degree, there is employed a contact 20 preferably movable longitudinally of the secondary. This contact may be constructed and operated in any suitable manner, but in the present instance it is in the form of a spring finger carried by a nut 21 that travels on a quick pitch screw 22. The screw may be journaled in the insulators 4 and 5 and project at one end through the insulator 5 to receive a thumb piece 23 by which it is rotated. The contact 20 is held firmly against the contacts 19 by engagement with a tie rod 7, the latter thus serving as a guide for the contact. This guide is electrically connected with a binding post 26 carried by the cylinder 18 in a manner to be described.

The upright portion 2 of the core also is surrounded by a secondary coil 27 formed by a very fine wire having numerous windings thus producing a current of high voltage and low amperage. One terminal 28 of this coil is electrically connected to a binding post 29, while the other terminal of the coil is formed by one of a longitudinal series of contacts 30 thereon to be engaged by a movable contact 31 which may be guided longitudinally of the coil on one of the tie rods 7 and operated by a quick pitch screw 32 that is journaled in insulators 4 and 5 and coöperates with a nut 33 carried by the contact 31. The screw extends to the outer face of the insulator 5 and carries a thumb piece 34, on the rotation of which the contact will be moved to cut in or out windings of the coil. The guide rod 7 is electrically connected by conductor 38 to a binding post 35 which is arranged on the cylinder and is electrically connected to the cylinder while a conductor 25 connects the guide rod 7 of contact 20 with guide rod 7 of contact 31.

In using this device, current may be supplied to a current consuming device having its terminals connected to binding posts 24 and 26 or to binding posts 29 and 35. The current from binding posts 24 and 26 is especially adapted for a cautery or other device requiring a very low voltage and high amperage while that obtained from binding posts 29 and 35 is adapted for a lamp or other device where a high voltage and low amperage is necessary.

From the foregoing it will thus be seen that there has been provided in one compact structure a device which will supply from the commercial current nearly any kind of current that may be desired. In operation it is simple and the parts are so constructed and arranged that they are not liable to get out of order.

I claim as my invention:

1. The combination with two insulators grooved on their opposed faces, of a core ar-

ranged between them and seated in the grooves, tie rods connecting the insulators, a primary coil surrounding the core, a pair of contacts carried by one insulator and connected directly to the terminals of the primary coil, a secondary coil surrounding the core, a pair of conductor securing devices carried by the device and connected to the terminals of the secondary coil, and an open ended cylinder engaging both insulators and inclosing the coils and the core.

2. In a transformer, the combination with a pair of insulators and a plug having two contacts connected to one of the insulators, of a core secured between the insulators, a primary surrounding the core and having its terminals secured directly to the contacts of the plug, a secondary coil surrounding the core and provided with a longitudinal series of contacts, a screw shaft journaled at its ends in the insulators, a nut operated by the screw shaft, a contact to coöperate with the longitudinal series of contacts operated by the nut, and a pair of conductor securing devices one connected with the movable contact and the other with the other terminal of the secondary coil.

3. In a transformer, the combination with a pair of insulators and a plug having two contacts and secured to one of the insulators, of a primary coil arranged between the insulators and having its terminals connected directly to the contacts of the plug, a secondary coil arranged between the insulators and having a longitudinal series of contacts, tie rods connecting the insulators, a contact guided on one of the tie rods and coöperating with the longitudinal series of contacts on the secondary coil, and means for moving said contact to cause the latter to coöperate with different contacts on the secondary coil.

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