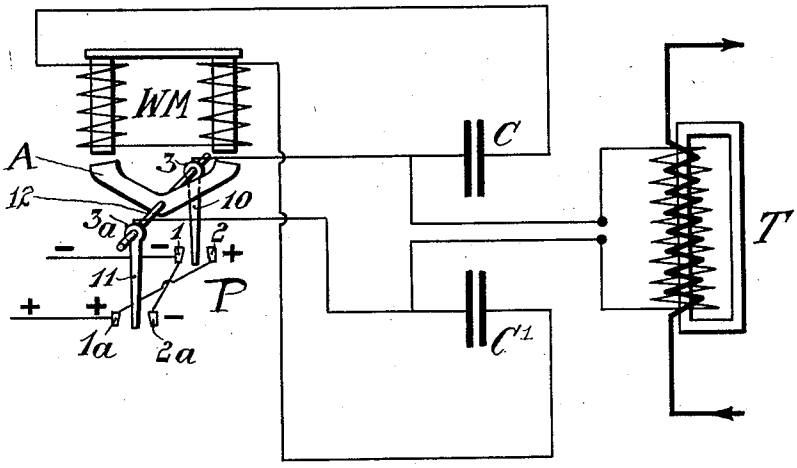
P. HILDEBRAND.

ELECTRIC CURRENT TRANSFORMER.

APPLICATION FILED FEB. 10, 1913.

**1,102,507.** Patented July 7, 1914.




Witnesses:
Louise Franck
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# UNITED STATES PATENT OFFICE.

PAUL HILDEBRAND, OF MUNICH, GERMANY.

## ELECTRIC-CURRENT TRANSFORMER.

1,102,507. Specification of Letters Patent. Patented July 7, 1914.

Application filed February 10, 1913. Serial No. 747,218.

*To all whom it may concern:*

Be it known that I, PAUL HILDEBRAND, a subject of the German Emperor, residing at Munich, in the Kingdom of Bavaria, German Empire, have invented certain new and useful Improvements in Electric-Current Transformers, of which the following is a specification.

My invention relates to a novel form of current transformer or converter for direct electric currents.

The principal object of the invention is to provide a transformer for weak electric currents, the construction of which is exceedingly simple, and whose operation is thoroughly efficient and reliable.

In carrying my invention into practice, I provide a transformer, preferably connected through a pair of condensers, with a pole changer, such as a pole changing switch and an alternating current electromagnet, the latter being adapted to actuate the switch in a manner more fully hereinafter described. Direct current from a suitable source is admitted to the device, the pole changing switch converting the direct current into alternating current which passes to the condensers, and a very small fractional part of the alternating current flowing from the condensers to the electromagnet which is thus operated by current of the same voltage as the direct current. The pole changing switch is preferably carried by or on the armature of the electromagnet, and therefore operates synchronously with the latter.

One embodiment of the invention is schematically illustrated in the accompanying drawing, wherein—

P designates generally a pole changing switch adapted to be actuated by an alternating current magnet W. M.; C and C′ are two condensers and T is a transformer. The switch P, above referred to, consists of two levers 10 and 11 insulated from each other on a rod or support 12 fixed in the armature A of the electromagnet W M. As the armature oscillates from one pole to the other of the magnet, the levers 10 and 11 are also caused to oscillate.

The operation of my novel form of transformer is as follows:—A direct current of say 110 or 220 volts is conducted over two pairs of suitable contacts, such as contact springs 1, $1^a$ and 2, $2^a$, so that the diagonally opposed contacts, *e. g.* $1^a$ and 2 have an opposite sign to that of the contacts 1 and $2^a$. Between these pairs of contacts, the two contact levers 10 and 11, insulated from each other, are caused by the magnet W. M. to oscillate. The levers 10 and 11 are secured to the rod 12 by means of eyes 3 and $3^a$, respectively. This oscillation of the levers causes quick changes of polarity and the consequent production of alternating currents of 110 volts, 220 volts, etc. The condensers C and C′ are charged with the alternating current, an exceedingly small part of this current flowing to the electromagnet W M to operate the same, and the balance of the current flowing through the transformer T by which the voltage is reduced to 6, 8, 10 volts etc., as desired. It has been found, in practice, that the amount of current flowing from the condensers C and C′ to the electromagnet W M and sufficient to operate the latter, is so slight as to be practically incapable of measurement.

Having described my invention, what I claim is:—

1. A current converter, embodying therein a current transformer, contact members electrically connected to a source of direct electric current, a pole changer electrically connected to said transformer and operatively related to said contacts, said pole changer adapted to convert direct current into alternating current before said current reaches the primary winding of said transformer, and an electromagnetic device energized by a part of said alternating current and adapted to actuate said pole changer.

2. A current converter, embodying therein a circuit including a current transformer and a pole changer, contact members electrically connected to a source of direct electric current, and an electromagnetic device included in said first named circuit and adapted to actuate said pole changer to convert the direct current passing from said contact members to said transformer into alternating current.

3. A current converter, embodying therein a circuit including a current transformer, a pole changer, and condenser members, contact members electrically connected to a source of direct electric current and in oper-

ative relation to said pole changer, and an electromagnet connected to said condenser members, and adapted to receive from the latter alternating current at the same voltage as said direct current, said electromagnet being adapted to actuate said pole changer.

In testimony whereof I have affixed my signature in presence of two witnesses.

PAUL HILDEBRAND.

Witnesses:
RICHARD LEMP,
JOHANNA STERN.