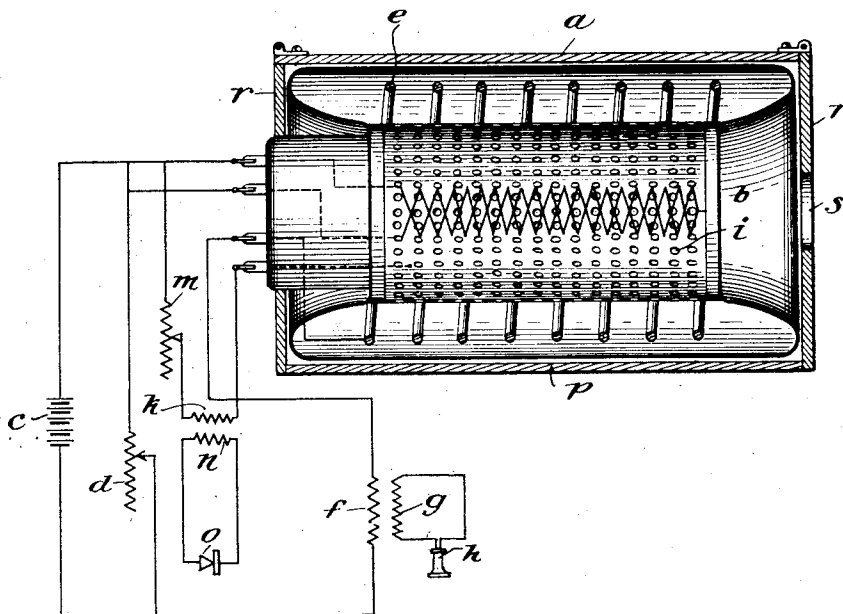


E. M. C. TIGERSTEDT.  
 RELAY FOR UNDULATORY CURRENTS.  
 APPLICATION FILED OCT. 19, 1916.

1,212,163.

Patented Jan. 9, 1917.



*Inventor:*  
 Eric M. C. Tigerstedt  
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 His Attorney.

# UNITED STATES PATENT OFFICE.

ERIC MAGNUS CAMPBELL TIGERSTEDT, OF COPENHAGEN, DENMARK.

## RELAY FOR UNDULATORY CURRENTS.

1,212,163.

Specification of Letters Patent.

Patented Jan. 9, 1917.

Application filed October 19, 1916. Serial No. 126,531.

To all whom it may concern:

Be it known that I, ERIC MAGNUS CAMPBELL TIGERSTEDT, a subject of the Emperor of Russia, residing at Copenhagen, Denmark, have invented a new and useful Improvement in Relays for Undulatory Currents; and I do hereby declare the following to be a full, clear, and exact description of the same.

The invention relates to a special construction of the kind of relays for undulatory currents in which the variation in the electric conductivity effected by the ionizer takes place by means of a grate- or sieve-like auxiliary electrode.

According to the invention the various electrodes are arranged interposed in one another and for this reason they are appropriately given a cylindrical shape. This arrangement of the electrodes entails two important advantages. On one hand the electrodes may be made as large as desired as the distance between the electrodes may be made uniform all over, whereby of course a considerable augmentation of the effect is made possible, and on the other hand the rays owing to their radial movements may be less unfavorably affected by outer magnetic and electric influences. This favorable effect may be further augmented if the relay be surrounded by a cylinder of soft iron or the like in which the vagrant lines of force are made uninjurious.

The drawing annexed shows by way of example a modification of the relay according to the invention.

The ray-relay *a* comprises the cathode *b* of a helically wound wire to which is led current for heating from a source of current *c* over a regulating rheostat *d*. The anode *e* likewise consisting of helically wound wire is over the primary winding *f* of an induction coil connected with the positive pole of the battery *c* while the secondary winding *g* of this coil is connected with a telephone *h*. A grate-shaped auxiliary electrode *i* arranged between the anode and the cathode is likewise cylinder-shaped and is over the secondary winding *k* of an induction coil and a regulating rheostat *m* connected with

one terminal of the cathode *b*, while the circuit is closed through the air-space between the cathode *b* and the auxiliary electrode *i*. The primary winding *n* belonging to the secondary winding *k* is arranged in the circuit of a microphone *o*. The relay is surrounded by a cylinder *p* of soft iron the ends of which are closed by covers *r* and in one of the said covers is found an opening *s* through which the relay can be watched during its working. The current variations in the primary winding *n* incurred by the microphone *o* are transmitted to the secondary winding *k* and the circuit of the auxiliary electrode *i*, so that the resistance between the latter and the cathode is thereby altered. Thereby the resistance of the discharging tube is altered in well known manner and the variations in the microphone circuit are transmitted to the primary current of the telephone circuit passing through the discharging tube.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent in U. S. A.:

1. A relay for undulatory currents comprising an airtightly closed evacuated container, an anode mounted therein, a perforated auxiliary electrode arranged inside the said anode, a cathode arranged inside the said auxiliary electrode and adapted to be heated by an electric current and magnetically and electrically conducting means surrounding said container.

2. A relay for undulatory currents comprising an airtightly closed evacuated container, an anode mounted therein, a perforated auxiliary electrode arranged inside the said anode, a cathode arranged inside the said auxiliary electrode and adapted to be heated by an electric current and a mantle consisting of a magnetically and electrically conducting substance surrounding the said container.

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

ERIC MAGNUS CAMPBELL TIGERSTEDT.

Witnesses:

VIGGO BLUM,  
GRETHE DAM.