No. 800,856. PATENTED OCT. 3, 1905.

I. KITSEE.

RECEIVING DEVICE FOR ELECTRIC TRANSMISSION.

APPLICATION FILED JUNE 14, 1905.

Fig. 1.

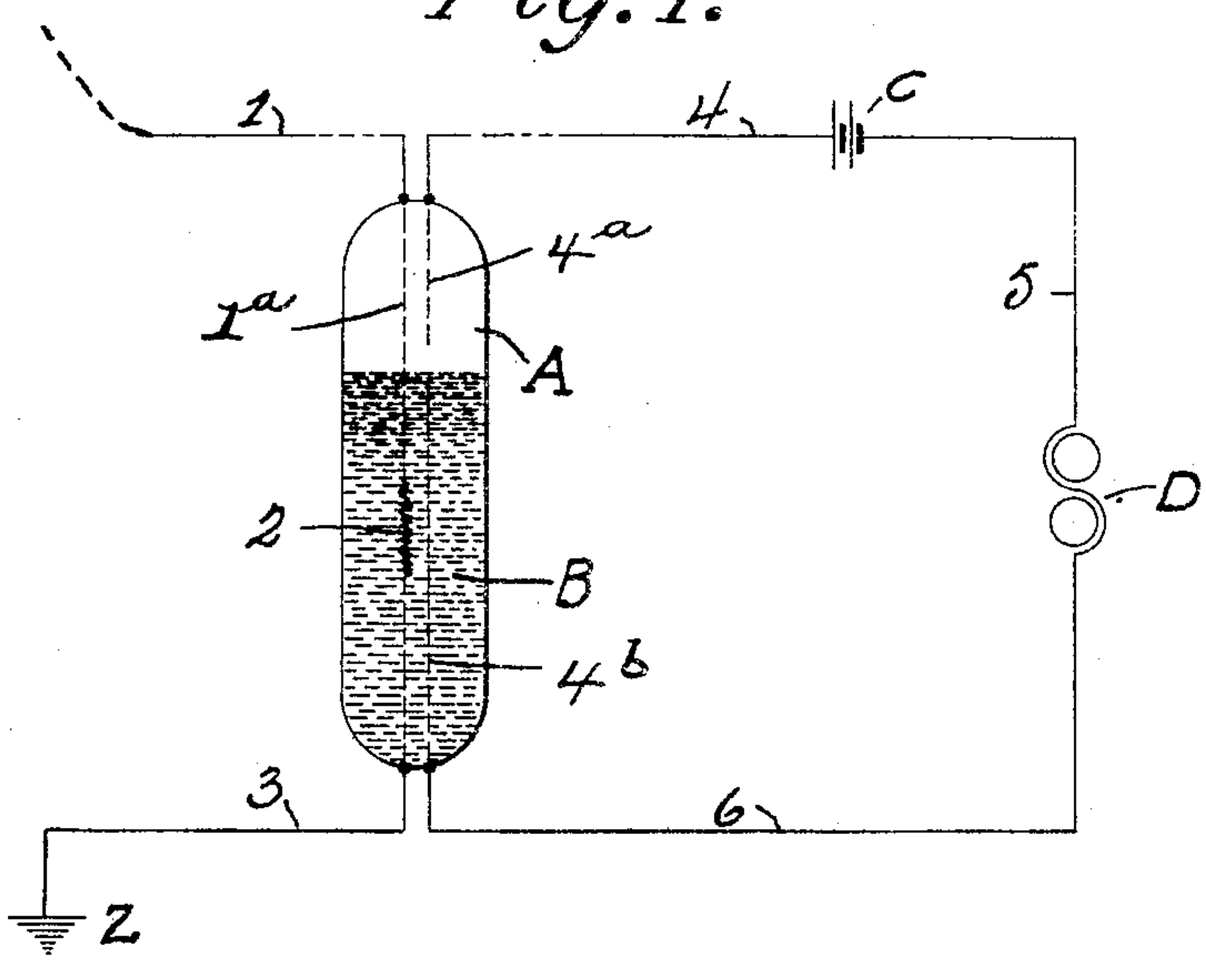
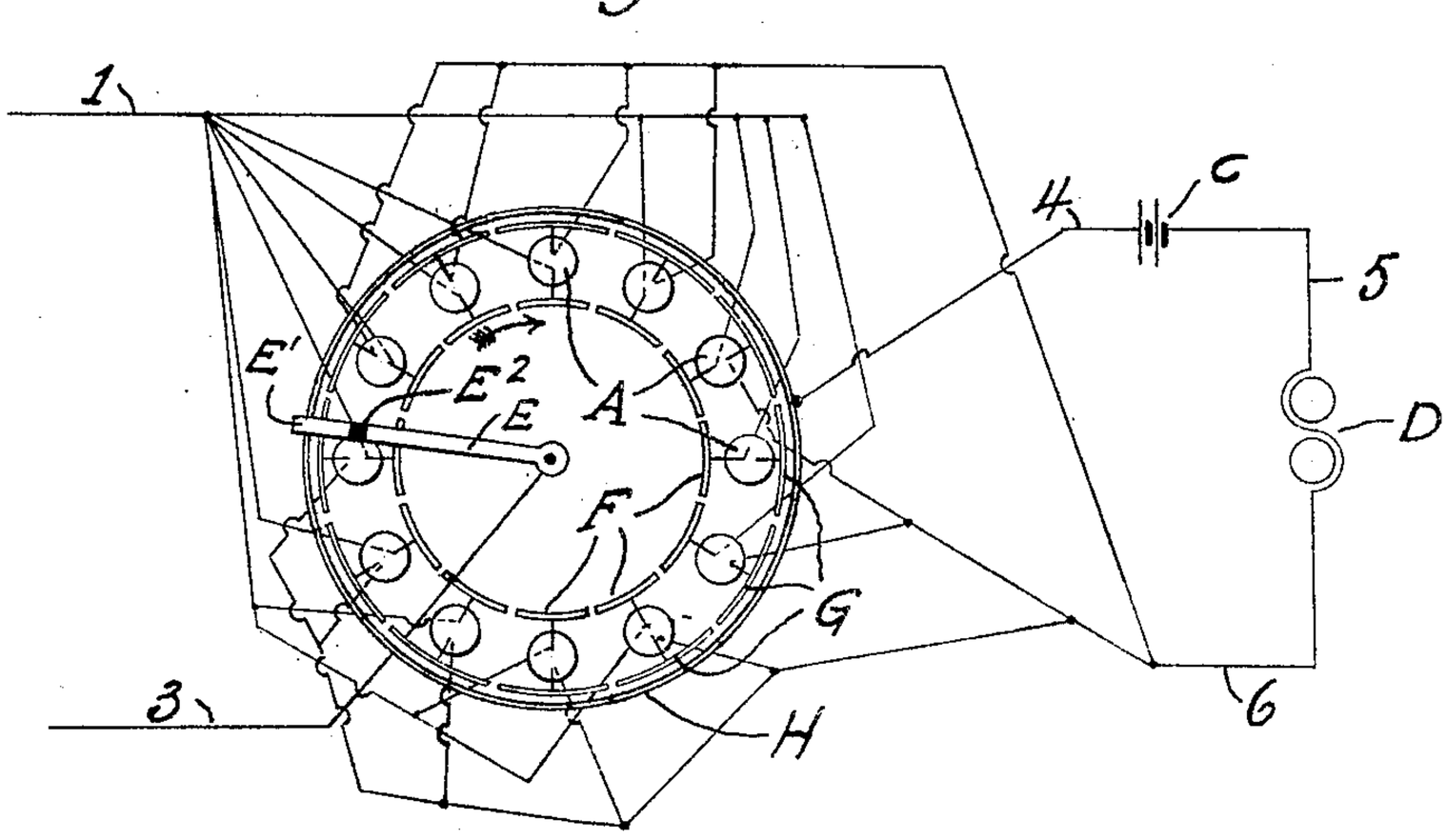


Fig. 2.



Witnesses
A. N. Cramer.
Edwin R. Stilley.

Isidor Kitsee
Inventor

UNITED STATES PATENT OFFICE.

ISIDOR KITSEE, OF PHILADELPHIA, PENNSYLVANIA.

RECEIVING DEVICE FOR ELECTRIC TRANSMISSION.

No. 800,856. Specification of Letters Patent. Patented Oct. 3, 1905.

Application filed June 14, 1905. Serial No. 265,172.

To all whom it may concern:

Be it known that I, ISIDOR KITSEE, of the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Receiving Devices for Electric Transmission, of which the following is a specification.

My invention relates to an improvement in receiving device for electric transmission. Its object is to produce a receiving device sensitive enough so as to receive impulses transmitted over lines or through natural mediums.

In the drawings, Figures 1 and 2 are partial plan and partial diagrammatic views illustrating my invention.

In Fig. 1, A is a receptacle, preferably of glass and preferably provided with a vacuum. B is the liquid contained therein; 1 the terminal of the line of transmission if such is used or the terminal of an aerial conductor if the device is used in space telegraphy. This terminal is connected to the conductor 1^a, inclosed in the receptacle A, and provided with the resistance 2, adapted to be heated through the passage of the impulses. This resistance may consist of a loop of very fine platinum or iridium wire. The free terminal of 1^a is connected to wire 3, grounded at Z. In the reservoir A are also inserted the conductors 4^a and 4^b. The conductor 4^a is connected, through wire 4, source of current C, conductor 5, with the translating device D. The other terminal of the translating device D is connected, through wire 6, with conductor 4^b. The liquid B in the reservoir A is of a height so as to allow a space to exist between the conductors 4^a and 4^b when no current is passing. The path of the current from the unidirective source C will normally be an interrupted one; but should through one cause or the other the level of the liquid B rise sufficiently so as to immerse the lower part of the conductor 4^a then, the liquid being conducting, a path will be established for the current flowing from C and the device D will therefore be actuated.

I have experimented with different liquids and found as follows: Ether is one of the fluids answering most readily to a rise of temperature due to the heating of the resistance 2; but ether alone is non-conducting and the path including the source of current C will remain inoperative no matter if the ether rises above the lower part of the conductor 4^a or not. The addition of about thirty per cent. of alcohol will produce a slight conductivity in the liquid; but naturally this liquid does not answer as quickly as ether itself to the heat. Acetone is conducting enough for all purposes, provided the translating device D is a sensitive one. It answers readily enough, but yet more sluggish than ether alone.

In all experiments I have found that ether would answer the purpose best, provided it can be made conductive without lessening its expansive property, and after trying different compounds I found that a slight addition of acetic ether produces the necessary conductivity without impairing its ready expansibility. The acetic ether does not need to be in a proportion greater than two per cent. of the ether proper.

The mode of working this instrument is as follows: Normally, as said above, the two conductors 4^a and 4^b are out of electrical contact with each other. If now an impluse flowing from 1 passes through 2 and 2 offers the necessary resistance, then 2 will be heated and the liquid will expand to a degree so as to place 4^a and 4^b in electrical connection with each other.

To give the device time to cool, a series of such instruments may be assembled and the current may be made to flow in succession through one and the other of these devices, and in Fig. 2 I have shown this method. In this figure F represents contact-points connecting with the upper terminals of the wires 1^a. E is a traveling lever adapted to make contact in rotation with one or the other of these contacts F. This lever E is in electrical contact with wire 3 and is also provided with the conducting part E′, separated from the lever proper by the non-conducting portion E^2. G represents contacts in electrical connection with conductor 4^a. The metallic ring H is in electrical connection with conductor 4. The working of this part of the device is as follows: Through its travel the lever E will ground the wire 1 of one or the other of the devices A in succession and will also connect in succession the conductor 4^a of one or the other of the devices with the conductor 4. As is obvious, the impulses will flow from 1 to the ground through that device which is connected to said ground through the traveling lever. With this arrangement time is given the liquid in the device formerly actuated to cool, and thereby assume its former state; but, as said above, the device A may be cooled by artificial means.

In the drawings the device A is greatly en-

larged, for in reality the tube does not need to exceed in dimensions the simple thermometer-tube. In fact, the bore may even be smaller, for it is obvious that the quantity of liquid should be reduced to the smallest minimum, so as to be most easily affected.

It is unnecessary for me to state that other well-known means may be employed to cool the heated liquid.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In electric transmission, a receiver embracing a volatile liquid, heating means connected to the line and immersed in said liquid, a local circuit embracing a source of current and translating means, the terminals of said local circuit in operative relation to said volatile liquid.

2. An electric relay or receiver embracing an inclosure provided with a vacuum, a volatile liquid in said inclosure, heating means immersed in said liquid and connected to the line, terminals of a local circuit adapted to be conductively connected through the rise of said liquid, said local circuit containing a source of current and translating means.

3. A receiving device or relay for electric impulses embracing a series of containers provided each with an easily-expansible liquid, heating means, and terminals of a local circuit, and means to connect the line to one or the other of said containers.

4. As a means to receive impulses in electric transmission a closed container provided with an easily-expansible liquid, an electric resistance, and terminals of a second circuit, the electric resistance adapted to be connected to the line and the terminals of the second circuit adapted to be connected to a local source and translating device.

5. As a means to actuate a local circuit with the aid of impulses received in electric transmission, a readily-expansible liquid, heating means for said liquid, terminals of a local circuit in operative relation to said liquid, the heating means adapted to be actuated by the received impulses and the local circuit adapted to be actuated through the rise and fall of the liquid.

In testimony whereof I hereby sign my name, in the presence of two subscribing witnesses, this 12th day of June, A. D. 1905.

ISIDOR KITSEE.

Witnesses:
EDITH R. STILLEY,
ALVAH RITTENHOUSE.