(No Model.)

D. W. DE FOREST.

Electric Condenser.

No. 239,370. **Patented March 29, 1881.**

Fig. 1.

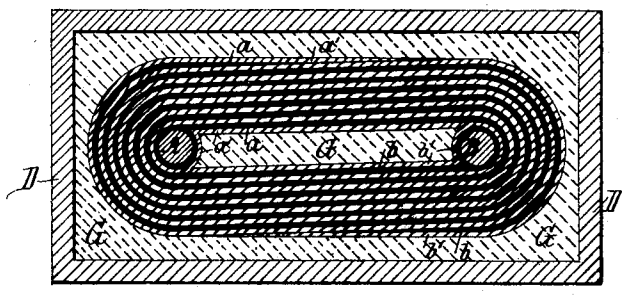


Fig. 2.

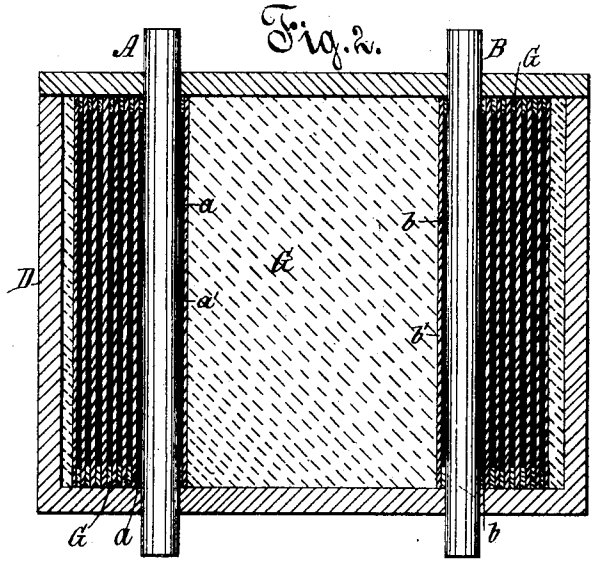
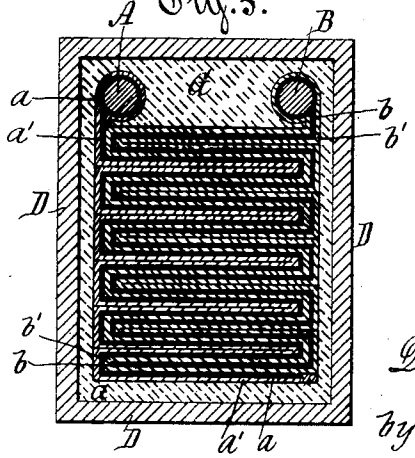


Fig. 3.



Witnesses:

Wm Hoecker

Chas. R. Clarke

Inventor:

David W. De Forest.

by Thos. G. Hoster.

his atty

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

DAVID W. DE FOREST, OF BROOKLYN, ASSIGNOR TO WILLIAM BUCHANAN, OF NEW YORK, N. Y.

ELECTRIC CONDENSER.

SPECIFICATION forming part of Letters Patent No. 239,370, dated March 29, 1881.

Application filed January 29, 1881. (No model.)

To all whom it may concern:

Be it known that I, DAVID W. DE FOREST, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Electric Condensers, of which the following is a specification.

My invention relates to electric condensers, and is an improvement on my application for Letters Patent for the same purpose filed November 17, 1880.

The objects of my present invention are, first, to produce an apparatus which is composed principally of but two long sheets of conducting material wound or folded alternately upon each other, with an intervening non-conducting or insulating substance; and, second, to insure the condenser from losing its charge by the action of moisture or other outside causes.

In the accompanying drawings, which form part of this specification, Figure 1 is a horizontal sectional view. Fig. 2 is a vertical longitudinal sectional view, and Fig. 3 represents a horizontal sectional view of a condenser in a modified form.

Similar letters refer to similar parts throughout the several views.

In the construction of my condensers I use for conductors of the positive and negative electricity two long thin sheets of a well-prepared good-conducting material, such as tinfoil, having a certain uniform width throughout. The length and width of the sheets depend on the desired capacity of the condenser. For the insulation I employ somewhat longer and wider sheets of a non-conducting material, such as paraffined paper, specially prepared gutta-percha, or other equally good non-conducting substance. The inner ends of the conductors are fastened, with their entire width, to the respective positive or negative pole by winding the said ends once or twice around the poles, and when the winding or folding of all the sheets has been accomplished in the manner hereinafter more fully described, the outer ends of the conductors are sealed up by the outer ends of the insulating material. In covering the width of the conductors with the width of the insulators, it will be noticed that the greater width of the latter leaves a margin (generally about one inch) on the upper and lower sides, which prevents the positive and negative conductors from forming a connection at these places. (See Fig. 2.)

In the drawings the heavy black lines represent the sheets of conducting material, and of which *a* is the conductor for the positive, and *b* the conductor for the negative, electricity.

A is a positive, and B is a negative, pole, placed a given distance apart, and connected in any desired way to sources of electricity.

The construction of my condensers is as follows: The inner end of the positive conductor *a* is wound once or twice around the positive pole A, and then covered on its outside by a sheet of insulating material, *a'*, and the inner end of the negative conductor *b* is wrapped once or twice around the negative pole B, and covered by a sheet of non-conducting material *b'*. The materials *a* and *a'* are then passed over to and wound on the sheets *b* and *b'* in such a manner that sheet *a* covers the sheet *b'*, (see Fig. 1,) and the sheets *b* and *b'* are passed over to and wound on the sheets *a* and *a'* on the pole A, so that conductor *b* lies next to the non-conductor *a'*, while the insulating-sheet *b'* covers the outside of conductor *b*. The several sheets of conducting and non-conducting material are now wound simultaneously upon each other in the manner just described until the outer ends of the conductors *a* and *b* are reached. Now, as the insulating-sheets *a'* and *b'* are somewhat longer than the conductors *a* and *b*, the outer ends of *a'* and *b'* are lapped over the outer ends of the conductors *a* and *b*, and thereby sealed, as may be plainly seen in Fig. 1. The inner ends of the insulating-sheets *a'* and *b'* are placed against the inner sides of the conductors *a* and *b* when they are passed as first layers from one pole to the other.

To prevent moisture or other good outside conductor of electricity to disturb the condenser, I place the latter in box D of non-conducting material, and fill the space not occupied by the condenser with a non-conducting substance, G. For this purpose I prefer to use melted paraffine, which, after being poured in the box D, is allowed to cool and become hard. In this way not only the unoccupied space in the box, but also the margins on the

upper and under sides of the condenser become filled up by the melted substance, whereby the greatest insulation of the conductors at their edges is insured. (See Fig. 2.)

The ends of the poles A and B are allowed to pass through the lid and bottom of the box D, where they may be connected to some source of electricity in any desired way.

In Fig. 3 is a condenser represented in which the inner ends of the conductors *a* and *b* are fastened to the respective poles A and B in the same manner as described before in reference to Figs. 1 and 2; but instead of winding the different sheets of conducting and non-conducting material, they are folded alternately upon each other, so that one or more sheets of insulating material intervene between the positive and negative conductors, and also cover completely the outsides, as may be seen in Fig. 3. The outer ends of the conductors *a* and *b* are sealed by lapping the outer ends of the insulators *a'* and *b'* over them. The so-constructed condenser may be placed in a box or other suitable receptacle, and the remaining space between the condenser and the box and the space on the upper and under margins filled with a non-conducting substance in the same way and manner as described before in regard to Figs. 1 and 2.

It will be observed that the outer ends of the conductors *a* and *b* have no connection with the outside whatever.

What I claim is—

1. In an electric condenser, the conductors *a* and *b*, each having its inner end wrapped once or twice around its respective pole A or B, and wound or folded in conjunction with the insulating materials *a'* and *b'*, alternately, upon each other, as described, and having the outer ends of the conductors *a* and *b* sealed up by the outer ends of the non-conducting materials *a'* and *b'*, as described, and for the purpose as specified.

2. In an electric condenser, the conductors *a* and *b*, the insulating materials *a'* and *b'*, the poles A and B, all arranged as described, in combination with the insulating substance G, as and for the purpose specified.

DAVID W. DE FOREST.

Witnesses:
THEO. G. HOSTER,
CHAS. R. CLARKE.