W. L. CASPER.

PAPER CONDENSER.

APPLICATION FILED AUG. 2, 1913.

1,116,013. Patented Nov. 3, 1914.

Fig. 1.

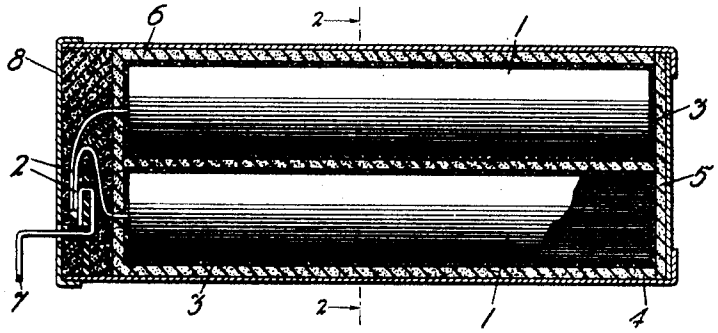


Fig. 2.

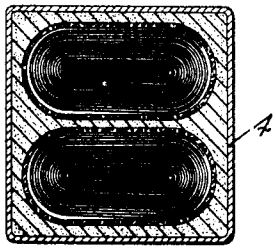
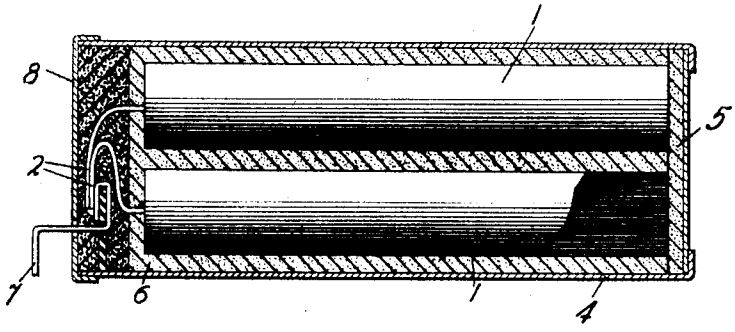


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PAPER CONDENSER.

1,116,013. Specification of Letters Patent. Patented Nov. 3, 1914.

Application filed August 2, 1913. Serial No. 782,638.

To all whom it may concern:

Be it known that I, WILLIAM LEE CASPER, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvements in Paper Condensers, of which the following is a full, clear, concise, and exact description.

This invention relates to condensers and the method of making the same, and its object is to produce a condenser which shall possess increased efficiency, shall remain permanent in insulation and resistance even though subjected to rough handling, and notwithstanding shall be compact and cheap to manufacture.

The invention broadly consists of condenser units formed of continuous strips of conducting material, such as foil, separated by strips of insulating material, as paper.

More particularly, the invention relates to means for inclosing the condenser units, whereby they will be retained in their original form and size and will remain sealed from the atmosphere when subjected to rough handling.

Referring now to the drawings—Figure 1 represents a condenser showing the container and the sealing material in cross-section; Fig. 2 is a section on the line 2—2 of Fig. 1; and Fig. 3 is a view, similar to Fig. 1, of a modified form of condenser.

In accordance with this invention the strips of conducting material and insulating material are first assembled by rolling them together to form a roll. After being rolled the units may be boiled in melted paraffin wax or similar material, subjected to slight pressure on the flat sides thereof, and allowed to cool and set. The unit or units is or are then placed in a container, the space between said container and the unit or units being filled by an insulating material which solidifies at normal atmospheric temperatures, and which is impervious to moisture. This insulating substance is in part at least of such a consistency that it is adapted to "cold flow" at ordinary temperatures; that is, if a break or crack is made therein by rough handling, it will flow sufficiently to cause it to coalesce or heal the break within a short time, whereby the unit remains protected from the deteriorating effects of the atmosphere.

This invention relates more particularly to the means for protecting the units from the atmosphere which tends to cause a decrease of insulation therein by carrying moisture to the strips of insulating material. The means of sealing also retains the condensers in their original form and size, thus maintaining their capacity constant.

The individual units or rolls with which my invention is illustrated may be formed substantially as disclosed in Patent No. 575,653 or in any desired manner.

Assuming that the individual units have been formed and then impregnated by boiling the same in paraffin wax or like material, and have been allowed to cool while pressure is applied to the sides thereof, we will consider the method of assembling the units, wherein resides the principal feature of this invention. After the paraffin or other substance has cooled, two of the rolls are secured together by uniting their terminals 2, as shown in Fig. 1. While in the drawings only one terminal is shown for each roll, it is of course understood that each is provided with two in the usual manner, the terminals being connected in pairs. The two rolls thus joined are then dipped in a molten insulating compound, which at ordinary temperatures is sufficiently solid not to cold flow. This compound may consist of asphaltum and rosin. I have found a compound consisting of approximately 80% of asphaltic cement, 8% of rosin, and 12% of Montan wax particularly satisfactory. As the quality of different samples of the materials used is not always the same, the exact proportions required can only be determined by experimenting with samples of the substances to be used. By this dipping process each unit will be entirely surrounded by a layer 3 of the relatively hard compound of asphaltum and rosin. The units after cooling are then inserted in a container 4 of tin or other material, the bottom of which has been previously covered to a slight depth by a pouring 5 of a compound impervious to moisture which is of such a consistency that it is adapted to cold flow or coalesce at normal atmospheric temperatures. This compound may be composed of rosin and rosin-oil united in portions of from 70% rosin and 30% of rosin-oil to 80% of rosin and 20% of rosin-oil, depending upon the quality of the substance used. Care being taken to insure that the unit is

evenly spaced from the sides of the can or container, an additional pouring 6 of the last mentioned compound is made extending above the ends of the rolls 1. The remaining space at the top of the can may now be filled with a pouring of the harder and more brittle compound first mentioned, which does not cold flow at ordinary temperatures. The container is now provided with a cap or cover 8 through which the terminal clips 7 secured to the terminals 2 project.

The commercial condenser formed as above described is of substantially two-microfarad capacity. If a condenser of one microfarad is desired, of course only one roll will be used, the process of manufacturing being otherwise substantially the same as just described.

Fig. 3 shows a condenser sealed in a slightly different manner, in that the dipping of the rolls in the harder and more brittle compound, prior to inserting them in the container, is omitted. The method of manufacturing this form is otherwise the same as just described.

In condensers as at present manufactured it has been found that they deteriorate very rapidly both as to capacity and insulation resistance, the deterioration in capacity being due to a loosening up or separating of the layers of conducting material, and the deterioration in insulation resistance being due to the admission of moisture to the layers of insulation. The containers or cans are oftentimes ruptured along the seams by rough handling, and under certain conditions rust holes soon appear therein. This invention, however, provides means whereby the condenser is effectively protected notwithstanding any openings which may be formed in the can and which, if the insulating covering should be cracked, will in a very short space of time coalesce so that the rolls at the worst will be exposed to the deteriorating effects of the atmosphere for but a brief space of time. The sealing substance employed, while adapted to cold flow slightly, is sufficiently solid to maintain the rolls in their original form, thus preventing a loosening up of the layers and consequent decrease of capacity.

What I claim is:

1. In a condenser, a unit consisting of alternate layers of conducting material and insulation, a container in which said unit is positioned, and a compound of rosin and rosin oil entirely surrounding said unit within said container.

2. In a condenser, a unit consisting of alternate layers of conducting material and insulation, a container in which said unit is positioned, and a compound of from 70% to 80% of rosin and from 30% to 20% of rosin oil surrounding said unit within said container.

3. In a condenser, a unit consisting of alternate layers of conducting material and insulation, a container in which said unit is positioned, a thin layer of comparatively hard asphaltic compound entirely surrounding said unit, and an insulating compound which will coalesce at normal atmospheric temperatures surrounding said layer of asphaltic compound.

4. In a condenser, a unit consisting of alternate layers of conducting material and insulation, a container in which said unit is positioned, a thin layer of comparatively hard asphaltic compound entirely surrounding said unit, and a compound of rosin and rosin oil surrounding said layer of asphaltic compound.

5. In a condenser, a unit consisting of alternate layers of conducting material and insulation, a container in which said unit is positioned, a thin layer of comparatively hard asphaltic compound entirely surrounding said unit, and a compound of approximately 75% rosin and 25% of rosin oil surrounding said layer of asphaltic compound.

In witness whereof, I hereunto subscribe my name this 30th day of July A. D., 1913.

WILLIAM LEE CASPER.

Witnesses:
ELLEN C. MOBERG,
ROSALIE M. SUNTER.