

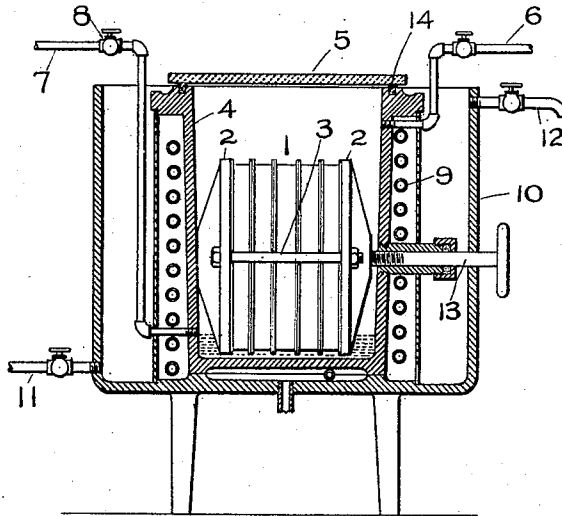
No. 691,675.

Patented Jan. 21, 1902.

E. THOMSON.
MANUFACTURE OF ELECTRICAL CONDENSERS.

(Application filed Jan. 2, 1901.)

(No Model.)



Witnesses:

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UNITED STATES PATENT OFFICE.

ELIHU THOMSON, OF SWAMPSCOTT, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

MANUFACTURE OF ELECTRICAL CONDENSERS.

SPECIFICATION forming part of Letters Patent No. 691,675, dated January 21, 1902.

Application filed January 2, 1901. Serial No. 41,826. (No model.)

To all whom it may concern:

Be it known that I, ELIHU THOMSON, a citizen of the United States, residing at Swampscott, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in the Manufacture of Electrical Condensers, (Case No. 1,976,) of which the following is a specification.

My present invention comprises various features of novelty, among which is a method of impregnation or insulation of particular value in connection with the manufacture of electrical condensers, although of course applicable to the treatment of other bodies as well.

As the invention includes various details of manipulation, it will be better understood by reference to the accompanying drawings, which illustrate an apparatus suitable for carrying my invention into operation.

The features of novelty of the invention will be pointed out in the claims appended hereto.

In treating condensers in accordance with my invention the first step is to assemble together a number of condensers, this being done for the purpose of convenience and to expedite the handling of the same. These condensers are arranged in a bunch and lightly pressed together by end plates connected together by screw-threaded rods, one of which is shown at 3. In the drawings the bunch of condensers is indicated at 1 and the end plates at 2. Before being inserted in the treating-tank (shown in the drawings) the bunch of condensers is first thoroughly baked for a number of hours in a hot oven in order to thoroughly dry the same and remove all traces of moisture. The condensers are then placed in the bottom of a treating-tank, such as 4, and a cover 5 is placed over the tank, this cover making an air-tight joint by reason of a rubber packing-ring 14 or other device. The interior of the tank is now connected to an air-pump, the connection in the present case being afforded by the pipe 6. By the operation of the air-pump the interior of the tank is exhausted, so as to form a fairly complete vacuum. The reduction in pressure about the condenser allows any air or other gaseous bodies which may be confined in the substance of the condenser to ex-

pand and gradually work out into the interior of the treating-tank, from which it is drawn out through the pipe 6 to the vacuum-pump, and thus expelled. The action is facilitated by the steam-pipes 9, which serve to maintain the interior of the tank in a heated condition. After the pumping has been continued a considerable period—as, for example, ten hours—molten insulating material is caused to flow into the bottom of the treating-tank, the level of the insulating material being allowed to rise so as to cover an inch or more of the bottom portion of the condensers 1, which are arranged on edge, as shown. This insulating material is in the apparatus illustrated supplied through a small pipe 7, extending to and communicating with a receptacle containing the molten insulating material. As soon as the valve 8 in this pipe is opened the vacuum in the chamber of the treating-tank draws the insulating fluid through the pipe into the treating-tank. As soon as the required amount has been admitted the valve 8 is closed. Steam or other heating fluid is maintained through the heating-coils 9, surrounding the treating-tank, 4, thereby keeping the insulating material in the bottom of the tank in a molten condition. The drawings illustrate the height of the insulating fluid in the treating-chamber at this stage in the process. After the fluid has been thus admitted the pumping is still continued and the steam in the heating-coils 9 is maintained. The insulating fluid being thus in a highly-fluid condition and being in a fairly complete vacuum is readily absorbed by the porous substance of the condensers, into which it is drawn by the action of capillary attraction. As the insulating fluid gradually creeps up through the condensers it pushes before it whatever bubbles of air or collection of gases or vapors may remain until when the entire substance of the condensers has become saturated with the insulating fluid the last trace of gas or vapor has been removed. After the condensers have thus become saturated with the insulating fluid through the action of capillary attraction the level of the insulating fluid in the treating-tank is allowed to rise until the condensers become wholly submerged. The air-pump is still kept in operation to insure the

removal of the last trace of air or vapor which may remain. The pumping may then be discontinued. The condensers and the surrounding mass of insulating material are now
 5 allowed to cool, this action being expedited, if desired, by the admission of a cooling liquid, such as water, to a tank 10, surrounding the treating-tank 4. The water may be admitted to the bottom by the valve 11 and
 10 drawn off by an overflow-valve 12 at the top. During the process of cooling, the insulating fluid as it solidifies contracts. To prevent the appearance of cracks due to this cause, I follow up the cooling of the condensers by
 15 the application of mechanical pressure, this pressure being applied in any suitable manner—as, for instance, by the compression-screw 13 passing through the side of the treating-tank 4 and acting to squeeze together the
 20 two retaining-plates 2, between which the condensers are held. The insulating fluid near the top of the tank may be maintained fluid while that below is cooling, this being done by passing steam only through one or
 25 two of the steam-pipes at the top of the tank. This insulating fluid may thus flow into and fill up any cracks that tend to form as the mass below cools. After the insulating material has solidified about the condensers the
 30 whole mass is removed from the treating-tank and the superfluous material trimmed off, the condensers then being separated and boxed. The insulating material may be disengaged from the sides of the treating-tank
 35 by temporarily passing steam through the heating-coils 9.

The insulating material which I employ to impregnate the condensers is formed mainly of paraffin-wax, the melting-point of which
 40 is raised by mixing therewith certain other waxes having a higher melting-point.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The method of impregnating an absorb-
 45 ent body which consists in subjecting it to a more or less perfect vacuum and while thus in vacuum causing it to absorb insulating fluid through partial submersion therein.

2. The method of impregnating an absorb-

ent body which consists in first drying it, 50 then partially submerging it in molten insulating material so as to allow an absorption of the same by capillary attraction, and afterward cooling the body thus impregnated.

3. The method of impregnating an absorb- 55 ent body which consists in partially submerging it in a body of molten insulating material and allowing the unsubmerged portion of the body to take up the molten material by capillary attraction, then totally sub- 60 merging the body, and allowing the mass to solidify.

4. The method of treating an absorbent body which consists in filling it with molten insulating material, cooling the same, and 65 applying a gradually-increased pressure as the cooling progresses.

5. The method of treating an absorbent body which consists in filling it with molten insulating material through the action of cap- 70 illary attraction, cooling the mass, and applying positive mechanical pressure as the cooling progresses.

6. The method of impregnating an absorb- 75 ent body which consists in partially submerging it in insulating fluid, then allowing the fluid to be absorbed by capillary attraction, then totally submerging the body.

7. The method of impregnating condensers which consists in baking the condensers so 80 as to thoroughly dry the same, maintaining a partial vacuum about the condenser to remove gaseous bodies confined in the substance of the condenser, partially submerging the condenser in a body of molten insulating 85 material and allowing the unsubmerged portion of the condenser to take up the insulating fluid through capillary attraction, then totally submerging the condenser, cooling the same slowly and applying pressure as the 90 cooling progresses.

In witness whereof I have hereunto set my hand this 27th day of December, 1900.

ELIHU THOMSON.

Witnesses:

DUGALD MCK. MCKILLOP,
 JOHN A. McMANUS.