W. DUBILIER.

SERIES CONDENSER.

APPLICATION FILED APR. 11, 1919.

1,327,593.

Patented Jan. 6, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

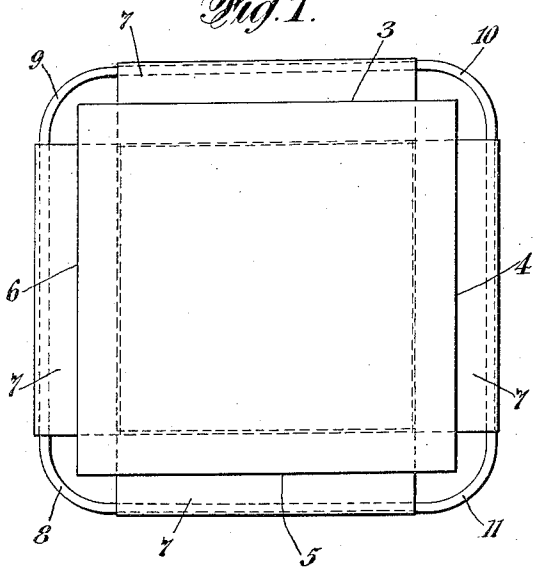


Fig. 2.

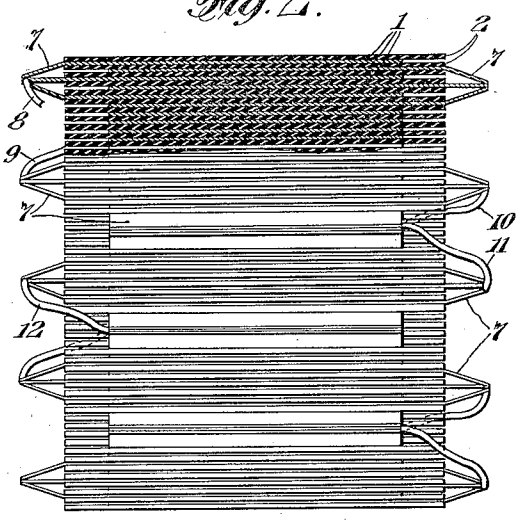
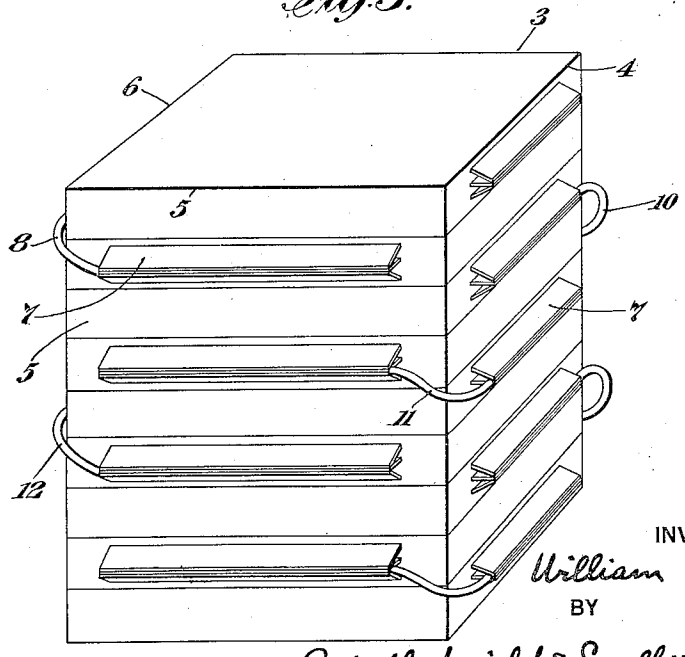


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

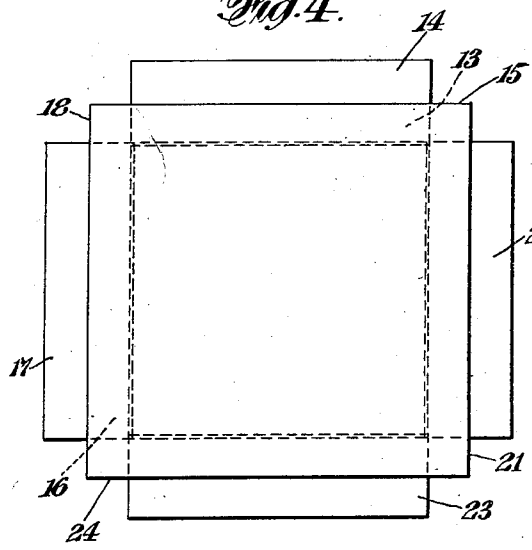


Fig. 5.

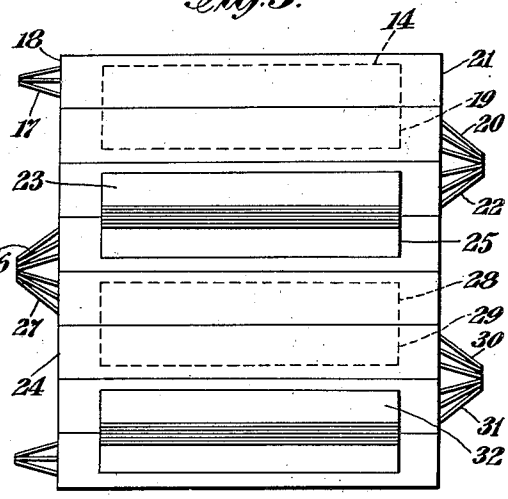
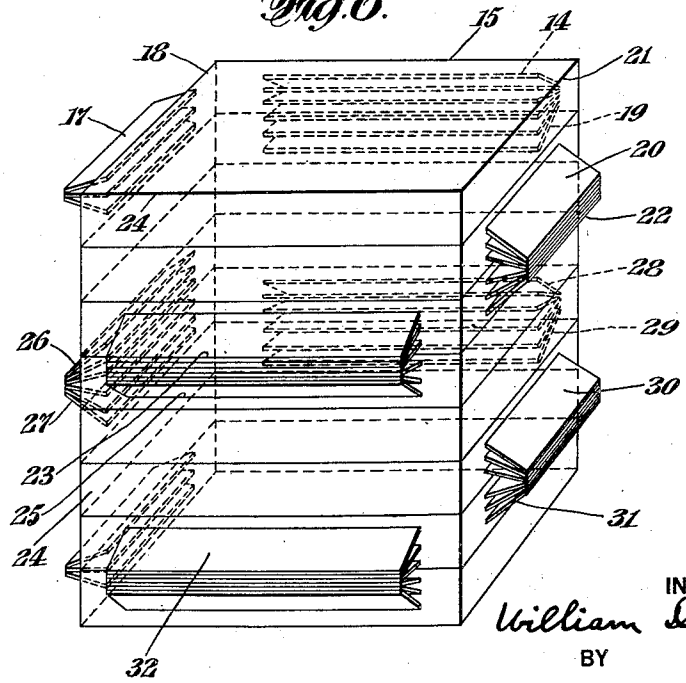


Fig. 6.



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UNITED STATES PATENT OFFICE.

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SERIES CONDENSER.

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To all whom it may concern:

Be it known that I, WILLIAM DUBILIER, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented a certain new and useful Series Condenser, of which the following is a specification.

The invention has for an object so to construct a condenser that the terminal connections may be readily made between different portions thereof.

Other objects are to provide a condenser in which such terminal connections will fall at points spaced to such an extent that the liability of an electrical discharge between terminals at different potentials is minimized, and to avoid the necessity of employing special insulating barriers or plates between the terminal connections.

Further objects and advantages of the invention will be in part obvious and in part specifically pointed out in the description hereinafter contained, in which are disclosed certain embodiments of the invention; such embodiments however are to be considered merely as illustrative of its principle. In the drawings:

Figures 1, 2 and 3 are respectively top, side and perspective views of a condenser made in accordance with the invention.

Figs. 4, 5, and 6 are views corresponding respectively to Figs. 1, 2 and 3, but showing another embodiment of the invention.

Referring to Figs. 1 to 3 of the drawings, a condenser is shown consisting of a plurality of conducting plates 1, separated by suitable insulating sheets 2 such as mica, the plates and sheets being assembled into a block preferably rectangular in shape, and having sides 3, 4, 5 and 6.

In the present instance, groups of conducting plates 1 are connected in parallel so as to form a plurality of sets of plates insulated from each other, which sets are of opposite polarity and may be connected in series to divide up the potential to which the condenser is to be subjected, to such an extent as to prevent a failure of insulation or breakdown in any portion thereof.

Terminals for each of the sets of plates are provided in any suitable manner, for instance by extending the edge portions of the plates of each set a short distance beyond the face of the block as shown at 7. The terminals of the different sets are then connected so as to place the requisite number of sets in series with each other, as previously described.

In order to prevent a discharge between terminals which are to be at different potentials in use, such terminals and their connections are brought out at different points around the sides of the block, so that each terminal will be spaced a relatively large distance from the others. In the embodiment shown in Figs. 1 to 3, this is accomplished by bringing out the terminals of successive sets on different faces of the block, the terminals of the sets of opposite polarity in the top layer being brought out for instance at sides 4 and 6 respectively of the block, and the terminals of the sets of opposite polarity in the second layer being brought out respectively at sides 3 and 5 of the block, the terminals for the sets of the third layer at sides 4 and 6 respectively, and so on. The top terminal 7, for instance on side 6 of the block, may then be connected as by a conducting strip 8 to the second terminal 7 on the face 5 of the block. The terminal 7 of the second layer, which is on face 3 of the block, may then be connected by a similar ribbon 9 to the terminal 7 of the third layer which is on face 6 of the block. The terminal 7 of the third layer which is on face 4 of the block, may then be connected by a similar ribbon 10 to the terminal 7 of the fourth layer which is on face 3 of the block. The terminal 7 of the fourth layer which is on face 5 of the block may be connected by a ribbon 11 to the terminal 7 of the fifth layer which is on face 4 of the block, and terminal 7 of the fifth layer which is on face 6 of the block being connected by a ribbon 12 to the terminal 7 of the sixth layer which is on face 5 of the block, and so on.

It will thus be seen that, with the above arrangement, the terminal connections 8, 9, 10, 11, etc., extend around the sides of the block in a spiral fashion, although a regular system of terminal connections is not essential so long as the terminals which are disposed at similar points around the sides of the condenser are spaced a relatively large distance from each other. In the form shown in Figs. 1 to 3, the terminals 8 to 12 for instance, are spaced a distance equal to the thickness of three groups of plates, so that the chances of a discharge between such connections are minimized.

If the terminal connection between succes-

sive groups of plates be made alternately at opposite sides of the block, as has sometimes been done, insulating barriers or plates are interposed between terminals and connections of different potentials which are located on the same face of the block, so as to prevent brush discharge therebetween, but such insulating barriers, aside from the greater expense which they entail, are awkward in that they leave the condenser terminals in pockets or recesses, with a result that such terminals are not readily accessible for manipulation in making the terminal connections. With a condenser constructed in accordance with this invention, the greater spacing between the connections obviates the necessity of employing insulating barriers between them, and no more insulation need be interposed between the superposed groups of plates, than is used between the different plates of the interleaved groups. Insulating sheets of substantially the same dimensions may therefore be used throughout, leaving the side faces of the block substantially plane, and the terminal 7 of the different groups projecting from such faces in such a way as to be easily acessible for making the terminal connections.

In Figs. 4 to 6 is disclosed a condenser of different construction, but in which the same principles are employed. As shown in Fig. 4, a group of condenser plates 13 may be connected in parallel and provided with a terminal 14 on one face of a block 15 similar to the one previously described, which terminal may be formed simply by extending edges of the plates of the group beyond such side face. A second group of plates 16 is interleaved with the group 14 previously mentioned, but has its common terminal 17 located for instance at the side 18 of the block adjacent to the side 15 which carries the first mentioned terminal 14. The interleaved groups of plates in the second layer may then have one terminal 19 located at the side face 15 of the block, and of the second terminal 20 located on the side face 21 of the block. The interleaved groups of the third layer may then have one terminal 22 extending from the face 21 of the block, and a second terminal 23 extending from the face 24 of the block, the terminals 25 and 26 of the fourth group being located respectively on faces 24 and 18 of the block, the terminals 27 and 28 of the fifth interleaved groups being respectively at faces 18 and 15, the terminals 29 and 30 of the sixth group being respectively at faces 15 and 21, the terminals 31 and 32 of the seventh group being respectively at faces 21 and 24, and so on.

Terminals 14 and 19, 20 and 22, 23 and 25, 26 and 27, 28 and 29, 30 and 31, etc., may then be joined together in any suitable manner to connect as many of the groups in series as is desired.

With an arrangement of the character above described, it will be noted that the terminal connections are disposed about the side faces of the block in what may also be termed a spiral fashion, the first connection being on face 15, the second on face 21, the third on face 24, the fourth on face 18, and so on, although a regular system of connections is not essential so long as successive connections be made at different points around the the sides of the block which will space the terminals and connections a relatively large distance from each other. With the spiral arrangement, connections and terminals such as 20 and 22, 30 and 31, which are disposed at similar sides or points around the sides of the block, are spaced from each other a distance approximately equal to the thickness of three interleaved groups of plates.

Therefore, no special insulating barriers between terminals or connections need be employed, but the faces of the block may be made substantially plane, with the terminals projecting therefrom in such a way as to be easily accessible.

While certain specific embodiments of the invention have been described, it is obvious that many changes may be made without departing from the spirit of the invention as defined in the following claims.

I claim:—

1. A condenser, comprising a plurality of conducting plates interleaved with insulating sheets and assembled into a block, groups of said plates being connected in parallel to form sets of plates of opposite polarity, and terminal connections between said sets of plates extending from different points around the block, said connections which are located at similar points around the block being spaced from each other a distance greater than the thickness of one of said sets of plates.

2. A condenser, comprising a plurality of conducting plates interleaved with insulating sheets and assembled into a block, groups of said plates being connected in parallel to form sets of plates of opposite polarity, and terminal connections between successive sets at adjacent faces of said block.

3. A condenser, comprising a plurality of conducting plates interleaved with insulating sheets and assembled into a block, the insulating sheets between said plates being all substantially coextensive in dimensions so that their edges are substantially in line with each other, groups of said plates being connected in parallel to form sets of plates of opposite polarity, and terminal connections extending from different points around the block, said connections which are located at similar points on the sides of the block being spaced from each other a

distance greater than the thickness of one of said sets of plates.

4. A condenser comprising a plurality of conducting plates interleaved with insulating sheets and assembled into a block, groups of said plates being connected in parallel to form sets of plates of opposite polarity, and terminal connections between successive sets of plates, said terminal connections being located on more than two sides of said block, and successive connections being at different points on the sides of said block.

5. A condenser comprising a plurality of conducting plates interleaved with insulating sheets and assembled into a block, groups of said plates being connected in parallel to form sets of plates of opposite polarity, and terminal connections between adjacent sets of plates, the connections for successive sets being disposed in spiral fashion around at least three sides of said block, so as to space each connection a relatively large distance from the others.

6. A condenser comprising a plurality of conducting plates interleaved with insulating sheets and assembled into a block, groups of said plates being connected in parallel to form sets of plates of opposite polarity, terminals for the groups located on the sides of said block, the terminals for successive layers of groups being at different faces of said block.

7. A condenser comprising a plurality of conducting plates interleaved with insulating sheets and assembled into a block, groups of said plates being connected in parallel to form sets of plates of opposite polarity, terminals for the groups located on the sides of said block, the terminals for successive layers of groups being so disposed that at least one of the terminals of each group is on a different face than one of the terminals of an adjacent group.

In testimony that I claim the foregoing, I have hereunto set my hand this 4th day of April, 1919.

WILLIAM DUBILIER.