

Jan. 4, 1927.

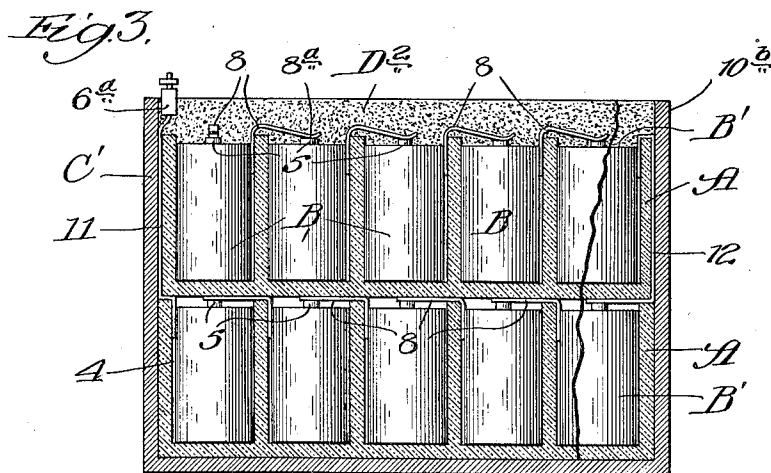
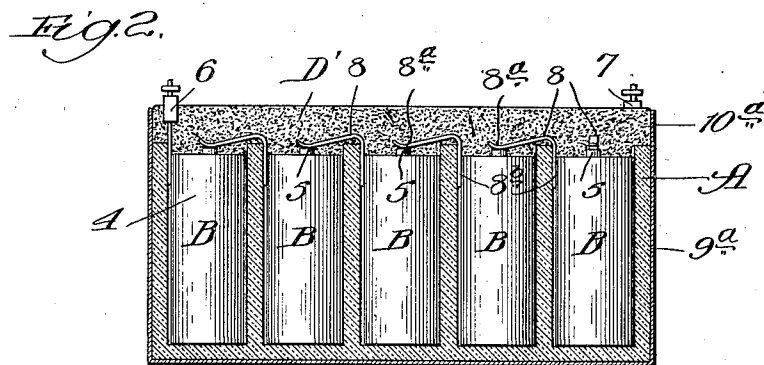
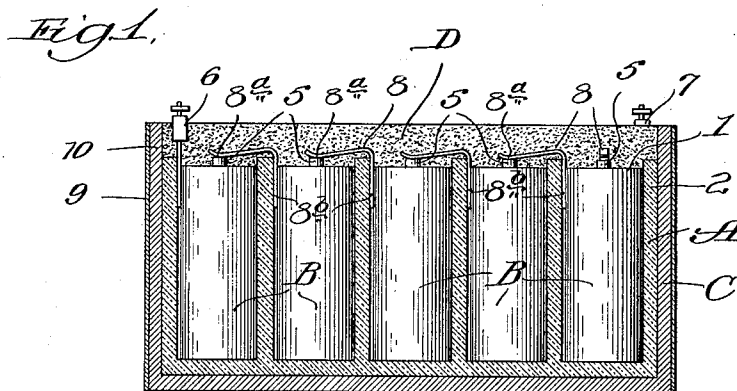
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1,613,327

DRY BATTERY

Filed May 12, 1924

2 Sheets-Sheet 1



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Fig. 4.

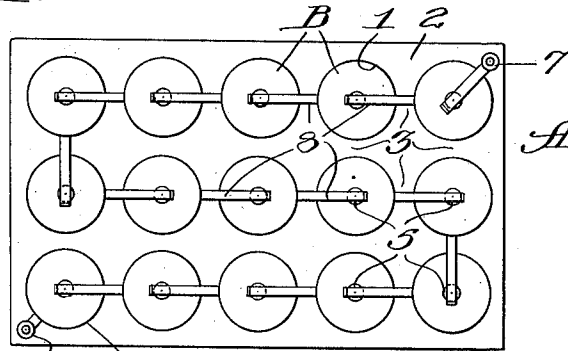


Fig. 5.

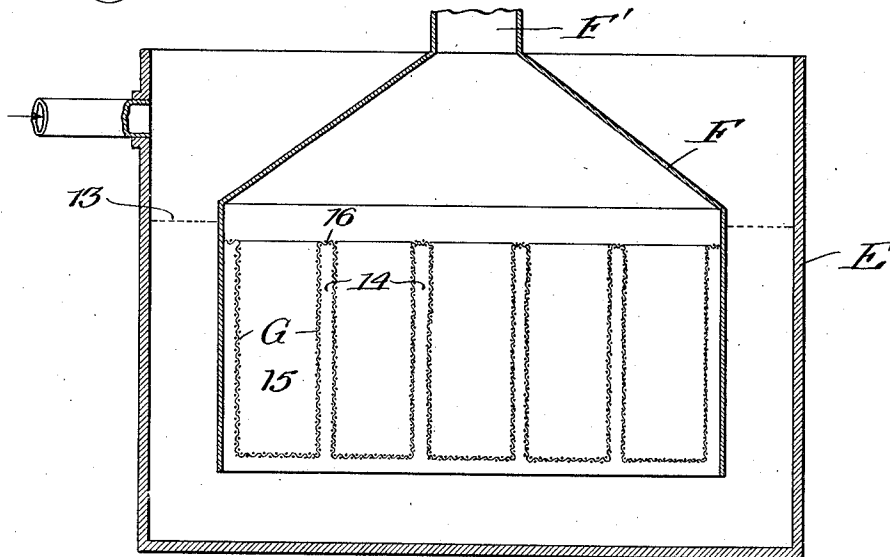
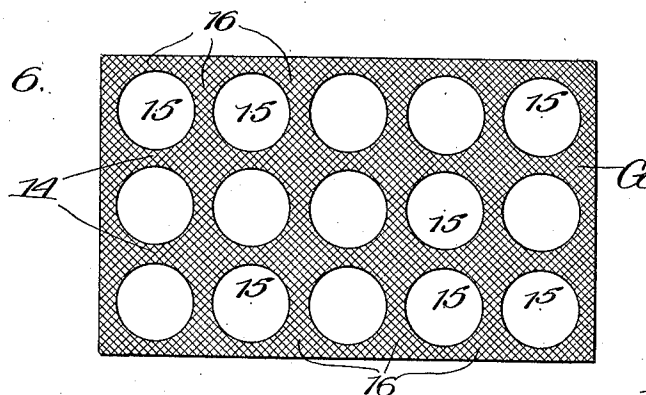


Fig. 6.



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DRY BATTERY.

Application filed May 12, 1924. Serial No. 712,839.

This invention relates particularly to a battery comprising a nest of dry cells, and to a method of producing the nest, or container, in which the dry cells are housed.

5 The improved battery is particularly well adapted for use as a B-battery for radio purposes.

The invention is illustrated in its preferred embodiment in the accompanying drawings, in which—

10 Figure 1 is a vertical sectional view of the improved battery in an embodiment in which the nest, or cell-container, and the dry cells confined therein, are inserted in a box and sealed therein; Fig. 2 is a similar sectional view showing a modification in which the cell-container has applied directly there-
15 to a label of heavy paper which projects above the plane of the top of the cell-container, thus affording a flange within the boundaries of which the seal is located; Fig. 3 is a vertical sectional view showing a modification in which two loaded cell-con-
20 tainers are contained in one box; Fig. 4 is a plan view of the cell-container and cell, shown in Fig. 1, for example; Fig. 5 is a vertical sectional view of a device for forming the molded cell-container; and Fig. 6 is a plan view of the wire form which is
25 shown in section in Fig. 5.

Referring to Figs. 1 and 4, A represents an integral molded cell-container provided with a plurality of cell-chambers, the container being molded, or formed, of fibrous
35 vegetable matter, such as wood pulp; B, dry cells located in the cell-chambers; C, a box into which the loaded cell-container is introduced; and D, a seal formed preferably from a suitable sealing compound, such as
40 sealing wax, or pitch.

The cell-container A may be formed, or molded, in a manner which will be explained with reference to Figs. 5 and 6; or, it may be formed by a pressing operation
45 in ordinary molds. When press-molded, the cell-container is composed of vegetable fibre, such as wood pulp, mixed with and impregnated by binding material, such as a solution of shellac, or any natural or artificial

resin. Any analogous binder may be employed. Preferably, the binder is both of
50 water-proofing character and of insulating character.

The cell-container is provided with rows of cell-chambers 1, marginal walls 2, and
55 division walls 3.

The dry cells may be ordinary flash-light cells having the usual zinc cups 4, affording one anode of the cell and having a central
60 contact 5 which projects from the central carbon anode. The naked cells may be introduced into the cell-chambers 1, that is, it is unnecessary to wrap the zinc cups with paper, or otherwise cover the zinc cups. The
65 electrical connections between the cells may be made in any desired manner. In the illustration given, the battery is equipped with a terminal 6 which is connected with a zinc
70 cup 4 of an initial cell, and a terminal 7 is connected with the central contact of the final cell, as shown in Fig. 4. The cells are connected, in this arrangement, in series by means of conductors 8. Each of the con-
75 ductors 8 may have one end attached to a central contact, or cap, as indicated at 8^a of one cell, and may have the other end extending downwardly into the upper end of the adjoining cell-chamber, as indicated at
80 8^b. The connectors 8 may be soldered to the brass caps forming the central terminals of the cells; and in assembling the cells, the contact between the downturned end of the connector and the zinc cup will be estab-
85 lished by the insertion of the cells in the assembling operation.

The box C may be an ordinary paste-board box, and may have applied thereto a paper label 9.

The upper margin of the box affords a flange 10 within which the seal D is located. The seal is preferably formed by pouring
90 fused sealing wax, or other suitable sealing compound, into the space above the dry cells after the loaded container has been introduced into the box. In the modification
95 shown in Fig. 2, the cell-container and the cells are of the same construction and arrangement as already described with reference to

Fig. 1, and corresponding parts are designated by the same reference characters. In this case, the paste-board box C is omitted and a heavy paper label 9^a is pasted directly upon the outer surface of the cell-container. The label is allowed to project above the plane of the top of the cell-container, thus affording the peripheral flange 10^a within which is confined the seal D'.

In the modification shown in Fig. 3, two molded cell-containers A, A, are used. These containers have in the cell-chambers thereof the cells B. The loaded containers are introduced into a box C' which is of great enough depth to receive the containers when superposed one above the other. In this case, the initial terminal 6^a is connected by a conductor 11 with the zinc cup 4 of a cell in the lower container, the strip 11 extending along the outer surface of one end of the upper container. The cells of the lower tier are connected in series by the conductors 8. The final cell of the lower tier is connected by a conductor 12 with the initial cell of the upper tier, the initial cell of the upper tier being, in this case, at the remote right-hand corner of the assembly. The cells of the upper tier are connected in a suitable arrangement by means of the connectors 8. Any desired arrangement may be employed as will be obvious to those skilled in the art.

In Fig. 3, the right-hand cells of the front and intermediate rows are shown broken away to expose portions of the remote cells, designated B'. The box C' has its upper end projecting above the plane of the upper surface of the upper cell-container, thus affording a peripheral flange 10^b within which is located the seal D².

The cell-chambers are of a form to conform to the zinc cups, which usually are of circular cross-section.

If desired, the integral cell-container may be formed by means of the device illustrated in Figs. 5 and 6, where E represents a tank or vat; F represents a bell; and G represents a wire-gauze form, or mold, which is removably held in the bell F. The tank E may be filled to the level designated 13, with water or solution containing wood pulp, for example. Suction is applied to the bell through the pipe F', thus drawing the water and pulp upwardly through the bell. The fibre collects in the spaces 14 which correspond with the walls of the cell-container. In this manner, an integral cell-container may be formed, which may be regarded as being virtually a molded container, since it conforms to, or is molded by the screen form G as the accretions of pulp are deposited against the walls afforded by the screen while the solution containing the pulp is drawn there-through. The wire screen form G may be

provided by pressing or molding a sheet of fine wire netting in such a manner as to provide the spaces 14 which correspond with the division walls of the cell, the spaces 15 which correspond with the cell-chambers, and the top plate 16 which corresponds with the top of the molded container.

After the cell-container has been formed in the devices shown in Figs. 5 and 6, the bell may be lifted from the solution, and, if desired, heat may be applied. The molded container may be loosened from the form by applying general air pressure through the bell; or, if desired, the air pressure may be applied before the container has been subjected to heating or drying, and may thereafter be heated or dried.

When the container is formed in the manner just described, it is preferred to immerse it in some water-proofing material of insulating character, or to otherwise impregnate the fibrous body composing the cell-container.

Molded cell-containers may be produced cheaply and expeditiously; they are light and strong; they may, with facility, be inserted in paste-board boxes within which they fit snugly; or, they may have labels applied directly to their outer surfaces in the manner illustrated in Fig. 2.

One advantage of the new construction and method of assembling is that it is unnecessary to coat or otherwise cover the exterior surfaces of the zinc-cups of the dry cells. The dry cell may be inserted, in naked condition, directly into the dry cell chamber; and the assembling operation may be cheaply and expeditiously performed. The dry cells are well insulated from each other, and are so securely held in position as to obviate danger of dislodgment or breakage.

Any suitable compound or composition which is light and fairly strong and adapted to the formation of the cell-container by molding, pressing, or forming, may be employed. Also, the box or wrapper which affords the peripheral wall about the sealing compound may be of any suitable material.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claim should be construed as broadly as permissible, in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

A battery comprising a plurality of integral molded cell-containers of fibrous composition, each cell-container having a plurality of cell-chambers open at the upper end, one of said containers being disposed above the other, dry cells confined in said chambers, a box containing the loaded containers

affording a flange extending above the upper container, sealing compound filling the space above the upper container, a terminal having a lead extending downwardly along the outer surface of one wall of the upper container and connected with the zinc-cup of a cell in the lower container, and a lead connected with the central terminal of one cell in the lower container and extending upwardly along the outer surface of one wall of the upper container and electrically connected at its upper end with a zinc cup of a cell in the upper container. 10

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