

L. Y. SPEAR & G. E. EDGAR.
BATTERY INSTALLATION.
APPLICATION FILED MAR. 13, 1911.

1,058,916.

Patented Apr. 15, 1913.

2 SHEETS-SHEET 1.

Fig. 1,

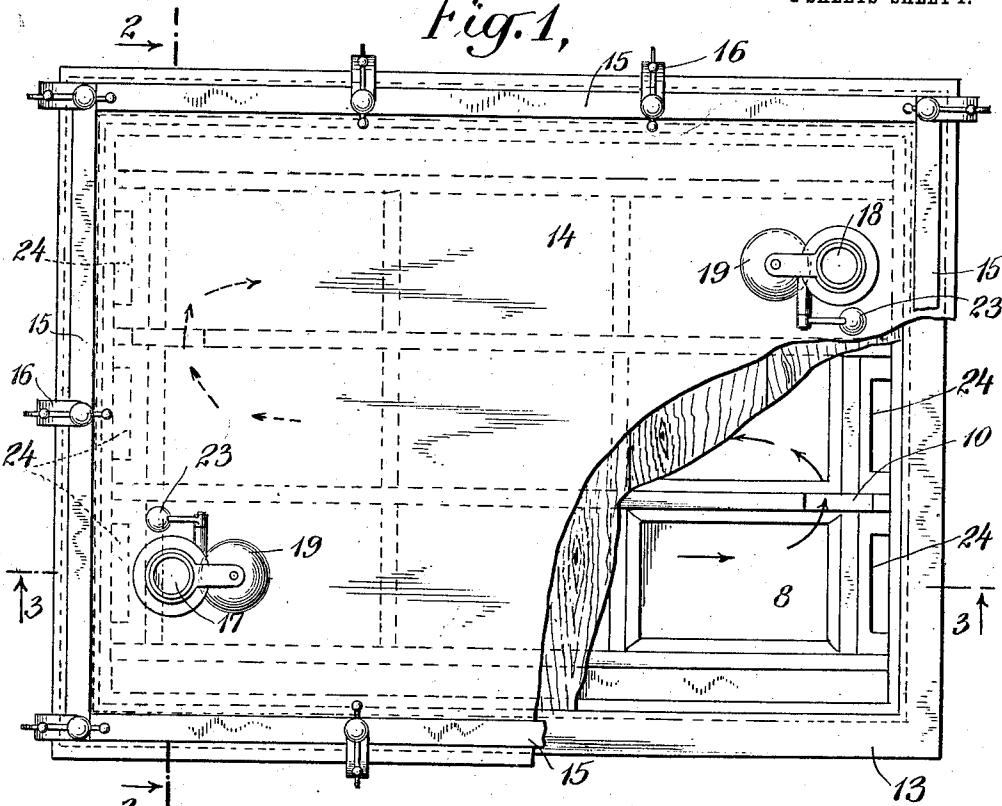
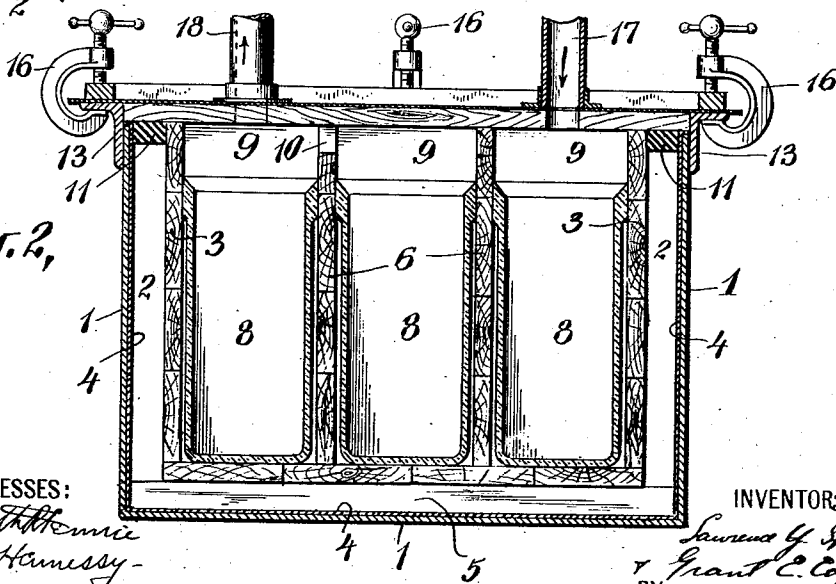


Fig. 2,



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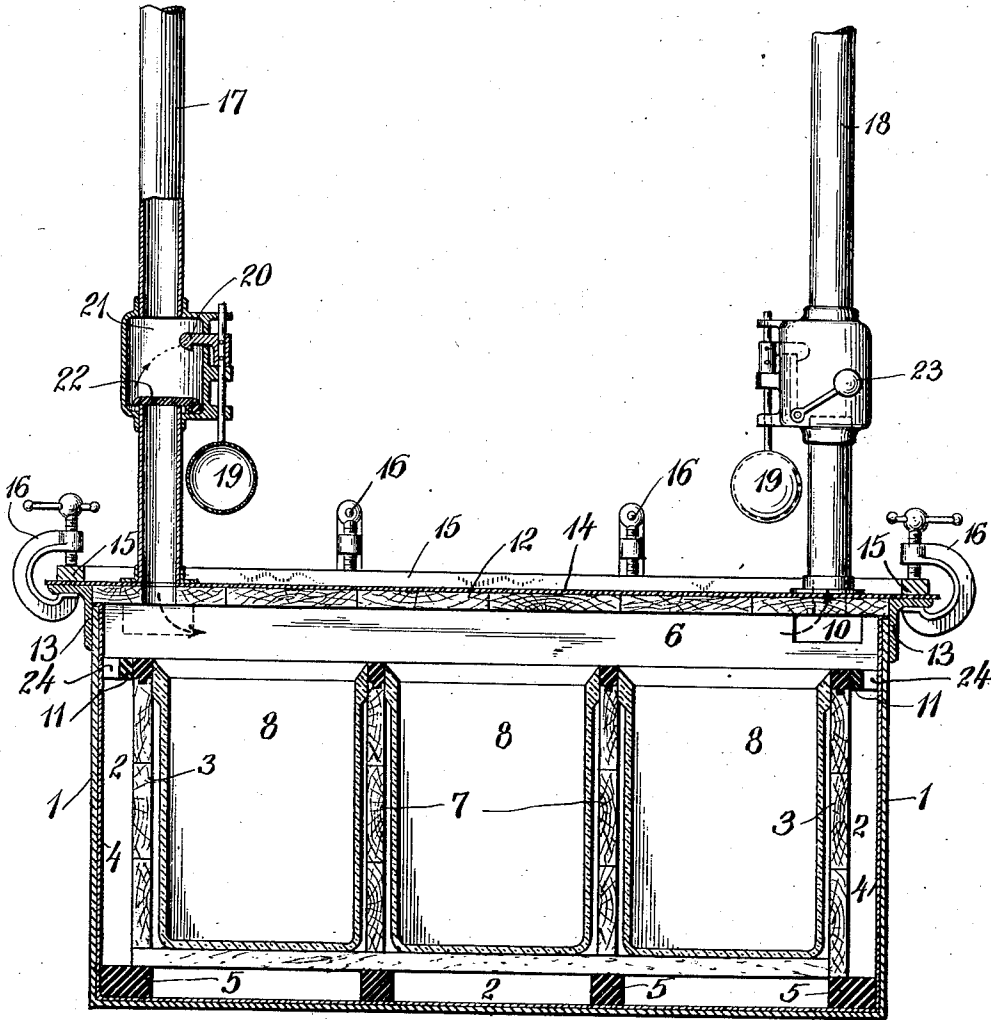
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Fig. 3,



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UNITED STATES PATENT OFFICE.

LAWRENCE Y. SPEAR AND GRANT E. EDGAR, OF QUINCY, MASSACHUSETTS, ASSIGNORS TO ELECTRIC BOAT COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

BATTERY INSTALLATION.

1,058,916.

Specification of Letters Patent.

Patented Apr. 15, 1913.

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To all whom it may concern:

Be it known that we, LAWRENCE Y. SPEAR and GRANT E. EDGAR, both residing at Quincy, Massachusetts, have invented certain new and useful Improvements in Battery Installations; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to primary or secondary battery installations and more particularly such as are used on marine vessels, railroad cars and automobiles, and it has for its objects, an improved form of tank to hold the battery, an improved form of ventilation to draw the gases from within such a tank, and means for automatically closing the ventilating pipes upon submergence of the tank.

In the accompanying drawings illustrating an embodiment of our invention, Figure 1, is a plan view of the battery installation, the cover being broken away to show the cellular compartments within the tank; Fig. 2, is a sectional elevation on line 2—2 of Fig. 1 and Fig. 3, is a sectional elevation on line 3—3 of Fig. 1, showing particularly the valves in the ventilating pipes.

The box consists of an outer tank 1, and an inner tank 3 with an open space 2 separating the two on the sides and bottom. The outer tank is constructed of metal or other suitable material and is lined on the inside with suitable material 4, as lead, to prevent electrolyte from getting out of the outer tank and then corroding the iron parts of the boat or other supporting structure. The inner tank is supported on the outer tank by the transverse members 5 suitably spaced to provide the proper support and bearing surface.

The inner tank 3 is constructed of wood or other insulating material and has longitudinal and transverse partitions 6 and 7 respectively, which serve to separate the inner tank into cellular compartments for the reception of the battery cells 8. The transverse partitions 7 do not reach the top of the inner tank, so that the longitudinal partitions 6, extending along the top of the compartments form a series of longitudinal ducts 9 over the top of the cells. Each of these partitions has an opening 10, at one of its ends and so located with respect to the

opening of adjacent partitions that air, propelled through the ducts, must pass back and forth through the longitudinal ducts in series as indicated by the arrows in Fig. 1.

The space between the inner and outer tanks is closed at the top along two sides of the tank by strips 11, but is open at the two ends as indicated by 24 in Fig. 1, whereby all electrolyte spilling from the cells readily passes into the space between the tanks. In this way electrolyte which would otherwise reach the metal parts of the boat or the supporting structure is kept within the battery tank even when spilled from the cells as the result of the rocking motion of the boat.

The outer tank is provided with a cover 12 which sits tightly on the top of the longitudinal partitions and overlies the edges of the outer tank. An angle 13 extends completely around the tank and is flush with the top of the cover. The cover is completely covered with a sheet of rubber, oil-cloth or other suitable water-proof material 14 which forms a water-tight joint with the angle 13 when the battens or strips 15 are tightly secured by clamps 16. The cover 14 is cut out to allow the entrance of the ventilating pipes, but is held down against the cover of the tank by the flanges which surround the pipes to hold them in position. When it is desired to uncover the tank, the ventilating pipes are removed and the clamps 16 are loosened so that the battens may be lifted. The cover 14 is then pulled off and the cover 12 is removed in sections or as a unit depending upon its construction.

Extending through the cover is an inlet pipe 17 and an outlet pipe 18. These pipes are at opposite sides of the tank, being on the same end if there is an even number of longitudinal ducts, and on different ends if there is an odd number of longitudinal ducts. The air which is made to enter through the pipe 17 by any known means passes over the first longitudinal row of cells, through the first opening 10 in the partition, to the next row, and thence serially over the remaining cells to the outlet pipe 18. In this way each cell is swept by the current of air and dangerous pockets of gases are avoided. Both the inlet and the outlet pipes contain a valve which is automatically closed upon submergence of the releasing mechanism. When water covers the top of the tank to a sufficient

depth, the float 19, rises and lifts the catch 20 in the chamber 21. The shutter 22 is then free to be closed by the action of the depending weight 23. In this way the cells
5 are entirely protected from the ingress of water, even upon complete submergence of the tank. When it is desired to close the valve in the inlet or outlet pipe, the float 19 is manually raised until the catch 20 is out
10 of engagement with the shutter 22, whereupon the shutter is pulled down and held tightly over the pipe by the weighted arm 23. To open either of the valves, the weighted arm 23 is lifted by hand until the
15 shutter 22 is caught by the catch 20.

Having thus described our invention what we claim is:

1. In a battery installation, a battery tank, a plurality of rows of battery cells in said
20 tank, a cover for said tank, air inlet and outlet pipes passing into said tank, and partitions between the rows of battery cells reaching to said cover and having openings
25 at alternate ends only so that the air ducts over said cells are in series throughout their length between said pipes.

2. In a battery installation, a tank for battery cells, and a water-tight cover for said tank, said cover comprising a part covering
30 the tank in such manner as not to exclude water, and a water-proof part extending over the edges of the tank, battens on the water-proof part extending completely around the edges of the tank, and clamps
35 adapted to hold the battens firmly in place in order to prevent the entrance of water between said cover parts at the edges of the tank upon submergence thereof.

3. In a battery installation, a tank for
40 battery cells, a cover for said tank, air inlet and outlet pipes through said cover, and longitudinal partitions in the tank reaching to said cover and having openings at alternate ends only so that the longitudinal air
45 ducts over said cells are in series throughout their length between said pipes.

4. In a battery installation, an inner tank for battery cells, an outer tank, a space be-

tween said tanks, a cover over the outer tank, air inlet and outlet pipes through said
50 cover, and longitudinal partitions in the inner tank reaching to the cover and having openings at alternate ends only so that the longitudinal air ducts over said cells are in series throughout their length between said
55 pipes.

5. In a battery installation, an inner tank containing battery cells closely fitted therein, an outer tank, a space between said tanks, a cover over the outer tank, and an opening
60 from the inner tank to the space between the tanks whereby electrolyte spilling from the cells collects in the space between the tanks.

6. In a battery installation, a tank for battery cells, a water-tight cover over said
65 tank, air inlet and outlet pipes through said cover with a water-tight joint, and a sealing valve located in each of said pipes and close to said cover, whereby the tank may be effectually sealed from without.

7. In a battery installation, a tank for battery cells, a water-tight cover over said
70 tank, air inlet and outlet pipes through said cover with water-tight joints, and sealing valves having releasing mechanism adapted
75 to automatically close both of the pipes against the entrance of water upon submergence of the tank.

8. In a battery installation, a tank for battery cells, a water-tight cover over said
80 tank, air inlet and outlet pipes through said cover with water-tight joints, and a sealing valve located in each of said pipes close to said cover and having releasing mechanism
85 adapted to automatically close the pipes against the entrance of water upon submergence, and a weight adapted to hold the valve effectually closed.

In testimony whereof we affix our signatures, in presence of two witnesses.

LAWRENCE Y. SPEAR.
GRANT E. EDGAR.

Witnesses:

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J. E. FITZGERALD, Jr.