

BATTERY APPROVED BY EDISON'S EXPERT

Report to Daniels Calls Inventor's Storage Device Most Suitable Obtainable.

DISCUSSES E-2 EXPLOSION

Prolonged Reversal of Cells Given as Cause — No Danger of Repetition of Accident.

Special to The New York Times.

WASHINGTON, Jan. 19.—The Edison storage battery, which was criticised after the explosion on the submarine E-2 at the New York Navy Yard a year ago, is declared by Lamar Lyndon, an eminent consulting engineer of New York, to be "the most suitable battery now obtainable for service on submarine vessels."

This is the expert opinion of Mr. Lyndon, given in an exhaustive report on the relative merits of the Edison battery and lead batteries submitted under date of Jan. 7, 1917, to Secretary Daniels, who will lay it before the House Naval Affairs Committee next week. On Oct. 7 last Thomas A. Edison retained Mr. Lyndon in a consulting and advisory capacity on the subject of storage batteries.

Mr. Edison directed Mr. Lyndon to get at the bottom of the whole matter, and said that although he, Mr. Edison, had spent several hundred thousand dollars trying to develop his new submarine battery, he would wipe the whole project off his slate and go out of the business of supplying submarine batteries, rather than be subjected to criticism, if Mr. Lyndon should report adversely.

The expert's report to Secretary Daniels says the E-2 explosion was caused by "prolonged reversal of the Edison cells," adding, "but, in spite of this fact, there is no danger to be apprehended from the production of explosive gases in Edison cells under operating conditions, whether normal or unusual. The unusual circumstances which produced this explosion and the impossibility of another similar occurrence in practice is clearly indicated."

"Most Suitable" Obtainable.

The report states that the Edison battery advantages so far outweigh the disadvantages that it is to be considered "the most suitable storage battery now obtainable for service on submarine vessels. It notes particularly that the battery will not generate the deadly chlorine gas.

Mr. Lyndon's report contains a summary and conclusions in part as follows:

"From the considerations which appear in this report, it is clear that the Edison storage battery is suitable for service in submarine boats because:

"It is the lightest battery and occupies the least space for a given output over a long period of time, of any now obtainable. Its electrolyte is non-corrosive and is not injurious to the steel work of the hull or fittings. It cannot cause leaks by corrosion of rivets or joints, no matter how much electrolyte might escape from the cells. In event of sea-water entering the boat through leaks caused by submarine mine explosions or otherwise, the personnel cannot be asphyxiated by the formation of chlorine gas.

"It is impossible to buckle or distort the plates. The capacity does not diminish with use until about half its life is passed, and the diminution is then very gradual. There is no dismantling the battery necessary for any purpose during its life. It has a longer life, under any given conditions, than any other available battery.

"The individual cells are comparatively light and may be easily handled, if necessary. A large excess emergency capacity may be stored by prolonged overcharge. An excess emergency capacity may be produced by increasing the density of the electrolyte. The plates are not injured by standing discharged in the electrolyte. No hydrometer readings are necessary.

Full Charge in an Hour.

"It can be charged at higher rates than any battery now obtainable. A full charge can be given it in one hour. A boat equipped with an Edison battery can be kept in service, and does not have to be laid up on account of battery conditions when it may be required for military purposes. In an emergency sea water can be used for replenishment of the electrolyte. Oxygen is given off at low rates of discharge. This helps to maintain the atmosphere of the boat in condition for breathing in a long period of submergence. Carbon dioxide exhaled from the personnel is absorbed by the potash of the electrolyte. In case of protracted enforced submergence the air can be circulated through some of the cells via the drain tubes and the carbon dioxide abstracted.

"It also has certain disadvantages, which are:

"It loses some of its charge if it stands idle. It has a somewhat lower electrical efficiency than lead cells. If one cycle immediately succeeds another at high rates, and this practice is continually followed, the life would be somewhat reduced.

"It requires a considerable quantity of cooling and ventilating air on charge. The rubber covering is detrimental to the operation of the cell, as it retains heat, thereby raising the temperature of the electrolyte. There are more cells in each battery to be replenished with water than obtains with a lead battery equipment."

Edison batteries have been installed on some of the new submarines of the navy, and a naval board reported unfavorably on them after the explosion on the E-2.

Cause of E-2 Explosion.

Regarding the E-2 explosion Mr. Lyndon says in part:

"This being the first submarine installation of these batteries in the navy the ventilation, according to claims made by Mr. Edison, was defective, some cells reaching abnormally high temperatures on both charge and discharge. An effort was made to improve the ventilation and the E-2 having gone to the dry dock, it was requested that all the cells of the Edison battery be discharged to zero in order that those which were of lower capacity than the others by reason of the improper distribution of cooling air might be located. While this discharge was being made Jan. 15, 1916, an explosion occurred.

"The crux of the situation is this: The guaranteed capacity of any Edison battery is delivered without any gassing or reversal, and this capacity is considerably exceeded before any reversal occurs. If a purchaser desires to obtain something in excess of that which has been sold to him, and for which he contracted, he can get it out of the Edison storage battery, but after passing this limit he must be willing to accept the changed conditions which arise when the guaranteed limit has been exceeded, and which, in any case, cannot become a menace in practical operation of a submarine boat.

"In other words, to stigmatize the Edison storage battery as dangerous, simply because it is able to give an emergency discharge, and because the plates are not injured by taking energy from them after the rated capacity has been discharged, is without proper basis. It means that the battery is actually penalized for one of its best qualities. If the Edison battery were subject to injury from overdischarge, and you had warned the authorities in the navy yard that your battery would be ruined if discharge were prolonged until the voltage fell below 150 volts, for the entire battery, just as the manufacturers of other types do, no reversal would have occurred, and the Edison battery would not now rest under any suspicion of being a dangerous contrivance.

"It is inconceivable that in the present knowledge of the Edison battery the available means of detecting low or reversed cells and the reliable devices for indicating the hydrogen content in a submarine boat, that any danger from explosive mixtures of evolved gases could, under any circumstances, ever occur."