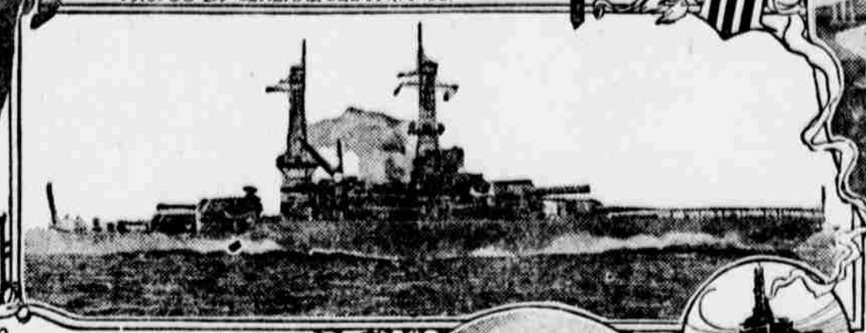
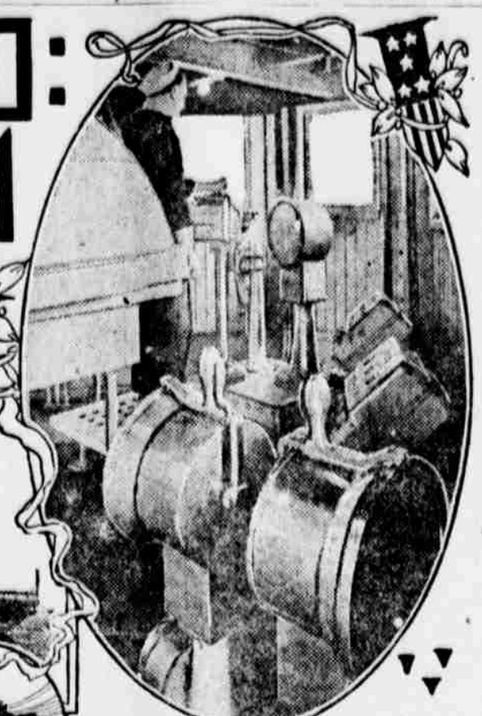
U.S.S. NEW MEXICO: First Electrified Battleship

PHOTOS BY GENERAL ELECTRIC CO.

CAPT. A. L. WILLARD

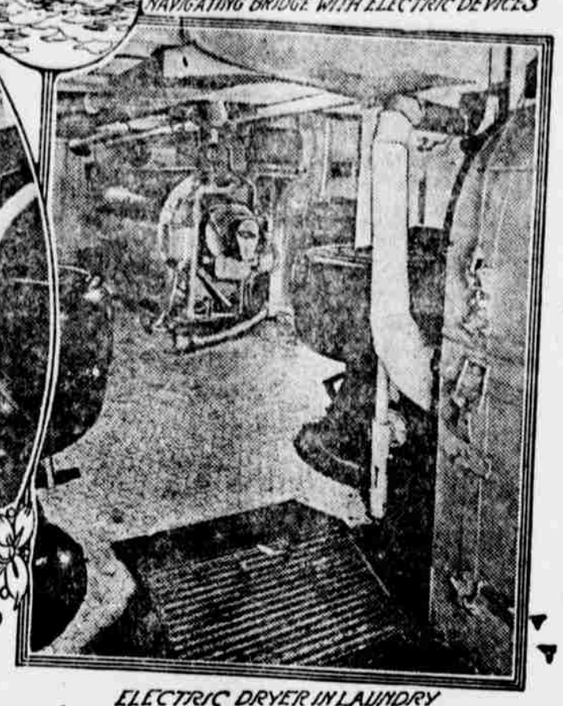


U.S.S. NEW MEXICO



NAVIGATING BRIDGE WITH ELECTRIC DEVICES

ELECTRIC DOUGH MIXER



ELECTRIC DRYER IN LAUNDRY

UNCLE Sam's superdreadnaught New Mexico is very much in the eyes of the world these days for the special reason that this battleship is the first of any nation to be propelled by electricty. Moreover, electric drive has been so successful and its fighting advantages have become so generally recognized that the navy department has decided to equip all of its new capital ships with electric propulsion apparatus.

The New Mexico is a most impressive fighting machine. She was built at the Brooklyn navy yard and launched in the summer of 1917. She is 624 feet over all. She weighs (displaces) 32,000 tons. She draws 30 feet of water. She has 97 feet 4½ inches beam at the waterline. At full speed she can make slightly in excess of 21 knots an hour. She generates 28,000 horsepower for propulsion. Her crew numbers nearly 1,200 men. She burns oil instead of coal as fuel and has a total fuel capacity of about 1,000,000 gallons.

It's not an easy thing nowadays to get permission to examine a battleship from stem to stern and to take photographs of her interior. But representatives of one of the big concerns which had a hand in making the New Mexico what she is was recently allowed the privilege—which has been exceedingly rare since the beginning of the great war. The following account of an inspection of the superdreadnaught at drydock in the Brooklyn navy yard is the result.

Lieut. Com. P. L. Carroll, chief engineer, turns us over to one of the junior engineers. We start with the navigating bridge and examine the various pieces of apparatus for transmitting signals to the engine room for the control of the vessel, and to half a dozen other parts of the ship, each of which has a particular and important function to perform. Next we begin a systematic survey of the ship, and to begin as far down into the vitals of the vessel as possible we are led through circuitous routes, down steep hatchways, through narrow alleys, and down more ladders, through deck after deck until we have lost all knowledge of time and space.

We find ourselves at last on the very bottom of the ship, directly behind the rudder. A complicated mass of machinery, pistons, rods, valves, dials and electric motors, combine to make up the steering gear engine. This machinery is operated and controlled directly from the navigating bridge by a control device. This is only one of five different methods of steering the ship. In a water-tight compartment directly aft is what is known as the auxiliary steering gear. And here we see four large wheels connected to a shaft which when occasion demands, can be used to move the rudder by hand—which takes eight men. But this shaft is also connected to an electric motor and by the simple turn of a switch can be operated electrically. Two other electrical units are situated in this compartment for rudder control and if all steering methods fail, a "jury" rudder may be rigged off the stern.

Going forward along the bottom of the ship we come presently to the propeller shafts—four in number—each operating an immense propeller. These shafts extend from the motors which operate them back through the ship and out at the stern, through what are known respectively as the starboard outboard shaft alley, starboard inboard, port inboard and port outboard alleys. Following forward along the inboard shaft we go through several more water-tight compartments, drop down a hatchway and find ourselves in the propelling motor room. This is the section of the ship which actually drives the propellers.

The tremendous motor which meets our gaze gives an inkling of the power necessary to make the big shafts revolve.

This motor stands 12 feet high from the floor and is 12 feet wide. It generates 7,000 horsepower. Like the rest, it is inclosed in a water-tight compartment, protected by bulkheads, and if anything should happen to it, the current may be cut off at once and directed to the operation of the other three propellers.

To see how the motor is controlled, reversed, started, stopped, etc., we follow the wire cables further forward, still almost on the bottom of the ship until we come to what the engineers call the center engine room. Here spread out before us lies a switchboard containing levers, dials, telephones, indicators, and instruments for measuring electrical currents. It is the main control station of the ship containing the arteries through which courses the life blood of the vessel, the electrical current. In fact, it is often called the heart of the vessel.

Here in this compartment the electrical current is received, measured and passed on to the motors which we have just left. From this station the propellers may be made to reverse, or to go at full speed ahead; two propellers may be reversed while the other two are driven ahead. Here also any combination of control may be made up. The flexibility of control made possible by this central control station constitutes one of the advantages of the system of electric drive. The captain of the ship communicates directly to this station and gives instructions concerning the control of the vessel.

Having seen how the ship is propelled, and controlled, we are naturally curious to see the source from which the tremendous energy comes. The cables from the switchboard lead us forward into another compartment where we view the machine which generates the electrical current which turns the propellers.

This is the turbo-generator section. There are two turbo-generators consisting of a steam turbine direct, connected to a powerful generator. This generator is operated by the steam turbine and produces the current we have been seeking. Each of the turbo-generators produces 14,000 horsepower. In technical language this spot within the ship is known as the power plant.

The turbine is an essential part of this plant. It illustrates another advantage of the electric drive. A steam turbine to operate at its maximum efficiency must revolve at a relatively high speed, say 2,000 revolutions per minute. On the other hand, the propeller to be most efficient, must revolve with comparative slowness, say 200 revolutions per minute. This is because if the propellers revolved at high speed they would merely churn up the water and fail to drive the vessel ahead.

Now electricity acts as a connecting link between this highspeed turbine and the low-speed motor which drives the propellers. Mechanical gears, which in the turbine driven vessel have been used to reduce the turbine speed down to a suitable propeller speed, are entirely eliminated, and the necessary reduction accomplished by simple electrical means. Moreover the operating units of vital importance are each inclosed in separate water-tight compartments. In addition the machinery is grouped very close to the center of the ship as far as possible away from the sides.

"The possibility of so grouping the machinery," says an officer, "means a greater protection of the apparatus from shell fire, grounding and collision. We might say that this feature, plus the flexibility of control and the ability to cut off defective or damaged apparatus, constitutes one of the essential superiorities of electric drive."

To follow the power route to its source, we must go still further forward to a point amidships. Here are nine huge steam boilers, arranged three in a compartment. They store up the steam under a pressure of 250 pounds to the square inch and deliver it to the turbines. The New Mexico burns oil instead of coal.

Thus the electrical propulsion equipment of the New Mexico may be briefly summarized as follows: Nine steam boilers deliver steam to two turbines. The two turbines operate two generators. The two generators produce electrical current. The electrical current is led through copper cables to a control station where it is distributed and passed on to four big motors. Each of the four motors turns a propeller and thus the ship is driven through the water.

The current which the two turbo-generators produce is used entirely in the actual propulsion of the vessel. The New Mexico must have additional electrical energy with which to operate scores of auxiliary apparatus.

For instance, electric motors operate the 12-inch and 14-inch guns, blowers which supply the ventilation of the ship, electric fans, telephones, heaters, pumps, refrigerating machinery, wireless apparatus, kitchen appliances, laundry equipment, etc., to say nothing of the lighting system. Motor-driven machinery also operates the boat cranes and the anchor windlass. There are scores of storage batteries which stand ready to keep the electric lights going should the main lighting system fail. It has been estimated that there are aboard the New Mexico no less than 50 electric motors.

"Where does the current come from to operate them?" we ask. It comes from six auxiliary turbo-generator sets and we find two of them well up toward the bow of the vessel, still on the same level as the boiler room from which we have just emerged. This turbo-generator, and the others similar to it, are responsible for the wonderful applications of electricity which we will make the acquaintance of as we go upward through the New Mexico. There are four separate decks between the bottom of the ship and the main deck.

All the baking is done electrically—electric motors operate the dough mixers, and dough kneaders, while the loaves are baked in electrically heated ovens. Next we visit the electric laundry with its many ingenious machines electrically driven. Electricity also plays its part in other places, such as the crew's library, reading room and recreation quarters; the barber shop; the sick bay, with its up-to-date operating room; Capt. A. L. Willard's quarters, the officers' wardrooms, etc.

The New Mexico has 12 14-inch guns and many of smaller caliber, including a battery of anti-aircraft guns. The larger caliber guns, three in each of four turrets, are operated by electricity. The turrets are revolved and the guns elevated by electric motors. Ammunition hoists run electrically and there are electric gun loaders, while even the big guns are fired by electrical means, but the smaller caliber guns are generally oprated by hand.

In examining into the control of these great batteries of destruction, we come to one of the most interesting spots on the ship—the conning tower. Navy regulations designed to withhold important matters of military design, forbid us from obtaining a picture of the conning tower. But it is permissible to describe it briefly. The conning tower is a well-shaped shaft extending perpendicularly through the ship from top to bottom with ladders running up and down the sides and convenient methods of transmitting instructions by means of indicators and telephones. During an action the vessel's commanding officer usually stations himself in this tower which is also known as one of several fire-control stations and transmits instructions.

Up on one of the masts we encounter one of the big "eyes" of the ship—an electrical eye which can see for miles in inky darkness. The current for the operation of the searchlight comes from one of the turbo-generators heretofore described.

Is the electrical propulsion of marine vessels opening up an entirely new era of scientific advancement and will the day come when the seven seas will be dotted with electric ships? So far as our own navy is concerned, Secretary Daniels expressed the essence of the idea when he said:

"I think this country has cause to be proud of this achievement in engineering, not alone because of the pronounced success in this particular instance (referring to the New Mexico), but because of the assurance it gives us of the superiority of our capital ships to those of foreign countries."

"The New Mexico is the first and only dreadnaught of any nation to have electrically operated propelling machinery," continued Secretary Daniels. "On this account she has been an object of surpassing interest to the officers of our own navy and to those of foreign navies as well, and to electrical engineers in general.

"The result was satisfactory from every point of view and confirmed the judgment of all who were in any way concerned in its design and adoption. There was not the slightest mishap with any part of it, everything worked to perfection, and the crew was as enthusiastic over the performance of the machinery as is the department proud in the possession of such an efficient dreadnaught.

"When we entered into contract for the machinery we stipulated that, in addition to being capable of developing the maximum power, she should also give an economy at cruising speed very much superior to that obtainable with the turbine installations previously used. This stringent requirement was also met. As a matter of fact, the New Mexico will steam at ten knots on less fuel than the best turbine-driven ship that preceded her."

Anyway, electrical engineers are now turning their attention to the adoption of similar principles to the driving of merchant ships and to large passenger vessels.

HAIR IN FLAMES; DIES FROM BURNS

Girl Uses Gas Heater Instead of Electric Drier After Swim.

FIRE ENVELOPS HEAD

Friends Attempt to Rescue Victim in Vain—Death Due Chiefly to Shock, Physicians Say—Inhaled Gas Fumes.

Pittsburgh.—A few minutes after little Miss Eleanor Asher scrambled merrily out of a swimming pool, she lay dying from shock caused by terrible burns.

Her hair caught fire while she was drying it over a gas heater at the Abington Y. M. C. A. and her death occurred in the Abington hospital.

Miss Asher, who was fifteen years of age, was the daughter of Mr. and Mrs. Sydney S. Asher, 1858 North Sixtieth street. At present they are occupying their summer home at Noble.

The Y. M. C. A. which is in York road near Susquehanna road, is given over to girls and women three nights of the week. Friday night was girls' night, and Miss Asher went over for a swim.

Laughing gayly after her plunge, Miss Asher went down to the locker room to dry her hair. There are two electric hair driers in the room, but the young women have found that the four gas heaters installed by Y. M. C. A. during the season of coal shortage, for the purpose of taking the chill off of the room, dry hair more quickly than do the electric driers. Their use, however, has been against the house rules.

Flames Envelop Head.

Miss Asher used the gas heater Friday night. She chatted pleasantly with the girls about her, as she lowered her head to the heater.

Suddenly her head was enveloped in flames. The strands of her long brown hair had touched the blue fire of the gas.

Miss Asher screamed and rushed wildly about the room. Her friends bravely made an effort to put out the flames, but they tried in vain.

Only Miss Ruddech, physical director for the women, seemed to have kept her mind free from hysteria. She heard the screams of the young women

Her Head Was Enveloped in Flames.

and the agonizing cry of little Miss Asher and rushed to the locker room.

Without hesitation she seized a heavy coat lying on the bench and threw it over the girl's head.

"Turn on the showers!" she cried to the weeping girls.

The shower was turned on and Miss Ruddach shoved the suffering child under the spray. By the time the flames were extinguished, Miss Asher had fainted.

Inhaled Gas Fumes.

Her face had been scarcely touched by the licking tongues of flame. Her shoulders and arms were burned and she had inhaled gas fumes.

She was hurried to the hospital, where she died late in the night, as a result of the shock, chiefly, the physicians say.

Coroner Neville of Montgomery county, investigated the case and pronounced the death due to accident. He exonerated the institution of any blame.

LOST BOY FOUND BY DOG

Child Hides in a Ditch, Afraid to Report the Loss of 10 Cents.

Youngstown.—Taken from a sewer ditch in Mill Creek park by a dog, Henry Martin, seven, told of having run away from his home in Salt Springs road Monday because he had lost 10 cents change which he had been given at a store.

J. Holt, a railroad policeman, went through the park early today. His dog stopped at the end of the ditch.

Unable to coax the animal to leave, Holt sent the dog into the ditch and the boy was dragged out.

Her Eyes to Blame.

Some time ago I had my eyes tested, belladonna being dropped in them to enlarge the pupils. The eye doctor assured me I'd be able to see perfectly provided with a pair of dark glasses. My friend, who was with me, said she wasn't so sure about it. On leaving the doctor's office we boarded a crowded car, my friend going to the front and leaving me to take a vacant seat in the rear. All of a sudden I could see hardly anything, and in sitting down I sat on a young man's lap. I quickly removed to the vacant seat beside him amid the titters and laughing of a group of college boys standing in the back entry. My only relief was in the black glasses I wore, for I knew no one would know me again without them.

Genteel Environment.

"What's Eloise doing now?"

"Welfare work in prison."

"It's too bad for a refined girl like that to come in contact with hardened criminals."

"Oh, she merely visits the banker's colony. It's really a high-class club, you know, whose members have moved in good society and expect to do so again as soon as their period of seclusion is over."—Birmingham Age-Herald.

Not a Happy Ending.

Mrs. Haman—This book ends with a marriage.

Haman—You like to read sad stories, don't you?