

NEW YORK, SUNDAY, SEPTEMBER 11, 1921.

# WHERE MONEY GOES TO MAKE OUR NAVY

## Itemized Bill for Ships and Guns Revelation to Layman

Superdreadnoughts of Maryland Class at \$42,000,000 Each, Fire 16-Inch Guns Costing \$2,048,000 and Using \$18,000 in Projectiles for Each Salvo---Torpedoes at \$15,000, Bombs at \$4,000, and Airplanes at \$27,000 Incidental Expenses of Service

**T**HE man in the street knows that our navy costs several hundred million dollars a year—and he stops right there. He knows next to nothing about where the money goes, or what for. It is the purpose of the accompanying article to tell him. The new battleships which are coming into commission are wonderful things. Take the Maryland, for example. Her cost is put at \$42,000,000. Each of her eight 16-inch guns cost \$256,000. When she fires a broadside it means \$18,000. A year's maintenance of the ship requires \$750,000, exclusive of pay. She carries 1,500 men. The bill for food will be about \$300,000 a year. You read of torpedoes. Each costs \$15,000. It is the most expensive piece of ordnance. Bombs appear to have become standardized, so to speak; one dollar to the pound, so that in cost they run as high as \$4,000 each, as two ton bombs are now being developed. An aviator in the navy receives \$300 a month, "flying pay," which, perhaps, the man in the street may not think excessive, all things considered. Altogether the article makes clear where the money goes.

maintenance. The battle projectiles—they are larger and more costly than the type used in target practice—weigh 2,100 pounds, or 100 pounds more than the largest of the airplane bombs already adopted as standard ammunition.

While the battle projectiles cost \$1,400 apiece, the type used in target practice cost but \$500 apiece. These are sufficient to train the gun crews and register just as accurately and travel just as far as those designed for action.

The newer types of battleships, laid down, but not completed, are to be even larger and much more expensive to operate than those of the type of the Maryland. A striking example of this is the battleship Iowa—the new Iowa—which is now building at Newport News, Va., to be finished in two or three years. In tonnage it will exceed the size of the Maryland by one-fourth.

### Old Iowa and the New One

#### In Striking Comparison

The new battleship Iowa and the old, which was one of the finest of the first line fighting ships at the time of the Spanish-American war, show, when compared, the remarkable strides in the development of war vessels in the last quarter century. It is spectacular in every way, in the size of the crew, the tonnage, the bore of the guns, the speed and the power of the engines, as well as the fuel.

Whereas the old battleship Iowa measured 360 feet from stem to stern, the new

out anybody aboard. She was under her own steam, but the battleship Ohio, a mile astern, steered her course for her at four knots by radio, while the bombers, from altitudes in excess of 4000 feet, rained bombs on her deck. Sooner or later, also operating with radio control, she is to be the target of fleet gunfire.

An even greater contrast in costs within the memory of men living is shown by the \$2,440,000 bid to build the Chicago, Boston, Atlanta and Dolphin in the '30's. This famous White Squadron, called by ex-Secretary John D. Long "the nucleus of the new navy," roused nationwide comment because of its cost. The total would just about keep one of the most modern superdreadnoughts in commission for a year, exclusive of its first cost of \$42,000,000 and upward.

The next highest size of heavy guns of the navy are 14-inch and they cost \$116,000 apiece to build. They also are good for 100 rounds without being relined. The projectiles for the 14-inch gun cost for battle \$900 apiece, while those for target practice cost \$300. It is a general rule that the projectiles used for target practice cost about one-third as much as those for battle, when a maximum destructive power is essential.

It is possible for the navy to buy in quantities the standard 5-inch guns used for the secondary batteries at \$6,000 apiece. The cost of the projectiles fired from these guns is \$20 apiece for battle type. The

SIX 14-INCH GUNS  
ON U.S.S. TENNESSEE  
COST \$116,000 EACH  
EACH SHOT \$900.  
SALVO \$10,800



U.S.S. MARYLAND  
COST \$42,000,000  
UPKEEP \$750,000 YEARLY  
PAYROLL \$1,200,000



ated that the payroll of such a ship amounts in a month to \$100,000. Each of the members of the crew receives on an average \$50 a month—the range being from \$25 to \$100, which would bring the figure to \$75,000. The officers' pay makes up the balance.

An allowance of 60 cents a day is made for each man for rations, so that the total cost of the food for the crew for a week amounts to \$6,300. The officers pay their own mess bills, buying their food in quantities and prorating the cost.

The greatest expense involved in maintaining a battleship, or any other naval vessel, for that matter, is for fuel, including oil and coal. The naval appropriation bill for the current fiscal year carries an item of \$17,500,000 for fuel, water and the like. Much depends, of course, on the

In view of the wide discussion of late of the relative value of airplanes and battleships, figures on the cost of aircraft are interesting. Even the most ardent aircraft enthusiasts caution, however, against the consideration of the figures as an argument either for or against airplanes or battleships, both being essential in any adequate programme of preparedness.

Twin motor planes, such as the Martin bombers of the army and navy and the F-5-L type of seaplane or flying boat used by the navy and for surveillance work by the army when the land planes are flying over water, cost around \$1.50 a minute to operate. This figure considers oil, gasoline and depreciation, but not the pay for the fliers and mechanics. A pilot in the navy receives, with flying pay, around \$300 a month, while mechanics, according to their grade, receive from \$75 a month to \$200 a month. On an average the twin motor plane carries a crew of five, two of whom, but rarely more than three, are commissioned officers.

Single seater airplanes, such as the SE-4 and Thomas Morse types of the army and the Vought type of the navy, cost about 80 cents a minute to operate while in the air, this, too, including oil, gasoline and depreciation. They are flown by one commissioned officer.

Twin motor airplanes cost from \$23,000 to \$28,000 apiece, while the single seater, which at the same time is a single motor airplane, costs around \$15,000 when obtained in quantity production. The Liberty motor, which is the standard for both the army and the navy, presents the largest cost. It can be used for 100 hours without being overhauled. Its actual life, after being repaired, is around 600 hours, but this of course varies.

Kite balloons cost about \$25,000 apiece. These are of the kind used by the navy for observation purposes, sent up by a battleship with a line attached to assist in the observation of gunfire. They are filled with helium or hydrogen gas at low cost.

The cost of rigid airships, such as the ZR-1, is much greater. The ZR-1, being built near Philadelphia for the United States Navy, will cost \$2,000,000, while the hangar at Lakehurst, N. J., constructed to house the ill-fated ZR-2 and the ZR-1, cost another \$2,000,000. There are no accurate details as to what the expense of maintenance will be, but it is known that it will be great. As one item alone a crew of 500 men will have to be retained to get the airship in and out of the hangar.

Congress provided \$13,000,000 for naval

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New York Herald Bureau,  
Washington, D. C., Sept. 10.

**W**HEN the United States dreadnought Maryland, which carries the heaviest armament of any fighting ship in the world, fires a broadside in battle it will cost, in round figures, a total of \$18,000.

Each of the projectiles fired in action from a 16-inch gun costs \$1,400. To this must be added a fair sum, estimated at \$850, for depreciation, bringing the total actual cost for each shot to \$2,250. This figure is without regard to the pay of the men composing the gun crew, the cost of their maintenance in food and clothes, the upkeep of range finding and other apparatus and so on through a long list of items that would run up into a staggering sum, difficult to estimate, naturally, with any degree of accuracy.

### Maryland Carries 8 16-Inch

#### Guns of 45 Calibre

The Maryland, which is just now being put into commission for the first line of the Atlantic fleet, having been delivered only a few weeks ago from the shipbuilders, carries, with other armament, eight 16-inch guns of 45 calibre. It is the only battleship in the world to have 16-inch guns in its turrets, the nearest approach to them being the 15-inch guns of the British. With \$2,250 set down as the fair cost on one 16-inch shot, a broadside of eight would send the total cost for this firing to \$18,000.

This is a sample of the great cost of modern warfare. The price of preparedness is less expensive, but it is, in a way, the payment of an insurance premium against the day when the United States may be called upon to go to war again and when it must be ready to make every minute count.

The 16-inch guns of the Maryland each cost \$256,000 to build and they are good for the firing of about one hundred shots apiece. Then they will have to be relined, at an outlay of approximately one-third of the original cost. The relining may be done three or four times, according to the character of the firing that has been done.

In addition to the 16-inch guns the Maryland's armament consists of fourteen 5-inch guns of .51 calibre, four 3-inch anti-aircraft guns, four 6-pound saluting guns and two 21-inch submerged torpedo tubes. While there are other fighting ships in the American fleet that are just as large, 33,590 tons, and measuring 600 feet in length and 97.3 across the beam, none of them is equipped with such armament.

It is because no such guns ever have been carried on fighting ships before that so much interest attaches among naval authorities now to the cost of firing and

battleship Iowa will measure almost twice as much, a total of 684 feet. The old battleship Iowa measured 72.2 feet across the beam, and the new battleship Iowa will measure 105 feet. The draft of the old battleship Iowa is 27.4 feet, while that of the new battleship will be 33 feet.

The speed of the onetime pride of the navy was 17 knots, while that of the new will be 23. Instead of the triple expansion engines developing 2,000 horse-power, as in the old, the new fighting ship, burning oil, not coal, will have an electric drive developing 60,000 horse-power.

The total displacement of the old battleship Iowa is 11,346 tons, while that of the new will be 43,200 tons.

The old Iowa had, when she went out of commission, a complement of 42 officers, commissioned and warrant, and 643 enlisted men, while the complement of the new battleship will be 65 officers, commissioned and warrant, and a crew of 1,400 men.

The old battleship Iowa had four 12-inch guns and eight 8-inch guns, whereas the armament of the new battleship will be twelve 16-inch guns, sixteen 6-inch guns, four 3-inch guns, four 6-pound saluting guns and two 21-inch torpedo tubes. It will cost virtually three times as much to operate the new battleship as it did the old one.

The old battleship Iowa, incidentally, was a target for navy bombers in the tests in June held off the Virginia Capes to determine the accuracy of dropping exploding missiles from the sky on a ship under way and capable of maneuvering.

The battleship, which stood out in sharp contrast with the much more powerful first line vessels of the fleet, such as the Pennsylvania, the Florida, the North Dakota and the Delaware, was operated with-



United States Navy 14-inch gun on a railroad carriage for testing. Extreme range 30 miles, projectile weighs 1,400 pounds, carriage, 320 tons. Battleships of the Tennessee class carry twelve of these monster weapons.

4-inch guns cost \$4,000 apiece and the cost of each projectile is \$15.

Every battleship, and every other type of naval craft, for that matter, is equipped with saluting guns to carry out the proffery of custom. These guns cost \$1,000 apiece and the price of the ammunition is around 20 cents a charge.

It is regarded by naval authorities as unfair to figure the cost of maintaining a battleship in with the cost of firing a gun, since in the interest of economy as few rounds as possible are shot. Target practice is indulged in just often enough to keep the crews in shape. Much time is spent in sighting the guns and manipulating them, without actual firing.

The cost of maintaining a modern battleship is around \$750,000 a year, exclusive

of pay, which considers no depreciation from the original outlay for the vessel, the cost of which for those of the first line is now \$42,000,000. In the past fighting ships of the first line have been kept in place as such for from twenty to thirty years, but even then their usefulness is not destroyed. The cruiser Olympia, for instance, which was Admiral Dewey's flagship during the battle of Manila Bay, is now the flagship of the train of the Atlantic fleet, the train being composed of such auxiliary craft as the Shawmut, mother-ship of the air forces; the hospital ship Mercy, the torpedo boat destroyer supply ship Black Hawk and others.

Such a modern warship as the dreadnought Maryland carries a crew of 1,500, with an officers' roster of 100. It is esti-

amount of cruising that is required for the fleet.

Of course, the heavy costs are for the very largest of the battleships. The bills for vessels like the destroyers are not so great. The destroyers do much more cruising than the battleships, but their crews are only in the neighborhood of 110, and they have only five officers aboard, occasionally six. The payroll for a destroyer runs in the neighborhood of \$6,000 a month, with everything else in proportion. The destroyers have five 5-inch guns. They are built for speed and, proportionately in weight, are a little more expensive to build than battleships. The modern destroyers—there are 347 in commission in the American fleets—displace up to 1,200 tons and cost around \$2,500,000.