

= Wyoming @-@ class battleship =

The Wyoming class was a pair of dreadnought battleships built for the United States Navy . The two ships , Wyoming and Arkansas , were authorized in early 1909 , and they were built between 1910 and 1912 . They were the fourth dreadnought design of the US Navy , and they marked an incremental improvement over the preceding Florida class . The primary changes being the addition of a sixth twin @-@ gun turret , bringing the number of 12 @-@ inch (305 mm) guns to twelve , and improved armor protection , including the first use of a torpedo bulkhead in an American battleship design . The Navy had seriously considered a significantly more powerful 14 @-@ inch (356 mm) gun , but it would have entailed major delays and required extensive harbor improvements to accommodate what would have been much larger ships .

The two ships frequently served together , first in the Atlantic Fleet in the 1910s . Both vessels were deployed to British waters after the United States entered World War I in April 1917 to reinforce the Royal Navy 's Grand Fleet . They served in the Pacific Fleet in 1919 ? 21 , before both returned to the Atlantic Fleet . Much of their time in the Atlantic Fleet was spent conducting peacetime training exercises , along with taking midshipmen from the US Naval Academy on training cruises . Wyoming and Arkansas were heavily modernized in the mid @-@ 1920s , receiving more efficient oil @-@ fired boilers to replace their old coal @-@ fired models , thicker deck armor to protect against plunging fire , anti @-@ torpedo bulges to increase their resistance to underwater damage , and anti @-@ aircraft guns to defend against aerial attacks .

The London Naval Treaty of 1930 mandated that Wyoming be demilitarized ; she accordingly was converted into a training ship , with half of her main battery turrets , belt armor , and anti @-@ torpedo bulges removed . Arkansas was permitted to continue in service with the fleet , however . After the United States entered World War II , Arkansas was used to escort convoys to North Africa . By 1944 , she served as a coastal bombardment vessel ; in this role , she supported Allied landings at Normandy (Operation Overlord) and southern France (Operation Dragoon) before being transferred to the Pacific , where she provided fire support to Marines fighting on Iwo Jima and at Okinawa in 1945 . Wyoming meanwhile continued as a training ship , being modified further in 1944 to include the various types of anti @-@ aircraft guns that trainees would operate in the fleet . Both ships were decommissioned shortly after the war , with Arkansas being expended as a target ship during the 1946 nuclear tests at Operation Crossroads , and Wyoming being sold for scrap in 1947 .

= = Design = =

On 22 July 1908 , the Newport Conference was held ; this included the General Board , the staff of the Naval War College , President Theodore Roosevelt ? who had a keen interest in naval matters ? and other officers . This conference examined a series of issues relating to existing battleships and new designs ; the first of these new ships would become the Wyoming class . The Board on Construction received general instructions from the Newport Conference ; those at the conference favored adopting the 14 @-@ inch gun , as the British Royal Navy had already traded their 12 @-@ inch guns for 13 @.@ 5 @-@ inch (343 mm) pieces . The Bureau of Ordnance (BuOrd) estimated that design work on the new gun , production , and testing would take two years . On 26 August , the Secretary of the Navy , Victor Metcalf , issued a request for eight- and ten @-@ gun battleships armed with the 14 @-@ inch weapons to the Bureau of Construction and Repair (C & R) . Speed was to be at least 20 kn (37 km / h ; 23 mph) , with as much armor as could be accommodated .

BuOrd argued that at likely battle ranges , 8 @,@ 000 to 8 @,@ 500 yd (7 @,@ 300 to 7 @,@ 800 m) , the 12 @-@ inch gun was powerful enough to penetrate existing armor , and so the 14 @-@ inch gun was unnecessary . C & R produced three designs to meet Metcalf 's request , all based on the preceding Florida design ; the first , referred to as design 404 , was a battleship armed with eight 14 @-@ inch guns . The second , design 502 , had an additional twin turret for a total of ten 14 @-@ inch guns . The third , design 601 , would be fitted with twelve 12 @-@ inch guns . The

General Board chose 601 , since the design work for the 14 @-@ inch gun had not begun , and adopting it would have caused the class to be delayed . In addition , the ships ' displacement would have increased more dramatically with the larger gun , requiring extensive improvements to harbor facilities ; design 502 would have only been able to dock in Pearl Harbor and Puget Sound with the existing facilities . The placement of the secondary battery also proved to be problematic . The cruise of the Great White Fleet in 1907 ? 09 had demonstrated the problems with casemates on the main deck . They were too easily washed out in even moderate seas , making them unusable . Some officers at the Newport Conference had advocated placing them in the superstructure , but the heavy 5 @-@ inch (127 mm) guns used by the Navy would have added excessive top weight . Another alternative was to place them in the forecastle , but the additional weight forward would have strained the ship where the forecastle stepped down to the main deck . The designers ultimately settled on a full @-@ length forecastle , which allowed the casemates to be moved about 4 ft (1 @.@ 2 m) higher in the hull .

The ships ' armor protection was improved over earlier designs . The belt and barbette armor was increased by an inch compared to an earlier version of the twelve @-@ gun battleship . A new protection scheme for the funnels was devised , after the Russian experience at the Battle of Tsushima three years before had highlighted the risk of a destroyed exhaust system . The designers also emphasized the need for improved underwater protection . As a result , the Wyomings design incorporated a torpedo bulkhead , the first time the feature was included on an American battleship design . Congress approved two new battleships , BB @-@ 32 and BB @-@ 33 , on 3 March 1909 . Design 502 later proved to be the basis for the subsequent class of battleships , the New Yorks .

== General characteristics and machinery ==

The ships of the Wyoming class were 554 ft (169 m) long at the waterline and 562 ft (171 m) long overall . They had a beam of 93 ft 3 in (28 @.@ 42 m) and a draft of 28 ft 7 in (9 m) . The ships displaced 26 @, @ 000 long tons (26 @, @ 417 t) as designed and up to 27 @, @ 243 long tons (27 @, @ 680 t) at full combat load . They had a full length flush deck , which improved sea @-@ keeping and the ability to work the secondary guns in heavier seas . Both ships were fitted with lattice masts . Their transverse metacentric height was 5 @.@ 4 ft (2 m) They had a crew of 58 officers and 1 @, @ 005 enlisted men .

The ships were powered by four @-@ shaft Parsons steam turbines rated at 28 @, @ 000 shp (21 @, @ 000 kW) . Steam was provided by twelve mixed oil and coal @-@ fired Babcock & Wilcox boilers , which were trunked into two closely spaced funnels amidships . The engines generated a top speed of 20 @.@ 5 kn (38 @.@ 0 km / h ; 23 @.@ 6 mph) , though on speed trials Arkansas made 21 @.@ 22 knots (39 @.@ 30 km / h ; 24 @.@ 42 mph) from 25 @, @ 546 shp (19 @, @ 050 kW) . Fuel capacity was 1 @, @ 667 long tons (1 @, @ 694 t) of coal and 266 long tons (270 t) of oil . This allowed the ships to cruise for 6 @, @ 700 nmi (12 @, @ 400 km ; 7 @, @ 700 mi) at a speed of 10 kn (19 km / h ; 12 mph) . At 20 kn (37 km / h ; 23 mph) , the range fell considerably , to 2 @, @ 655 nmi (4 @, @ 917 km ; 3 @, @ 055 mi) . Steering was controlled by a single rudder .

== Armament ==

The ships were armed with a main battery of twelve 12 @-@ inch / 50 caliber Mark 7 Mod 0 guns in six Mark 9 twin @-@ gun turrets all on the centerline , two of which were placed in a superfiring pair forward . The other four turrets were placed aft of the superstructure in two superfiring pairs . These guns fired a 870 lb (395 kg) shell with a 353 lb (160 kg) propellant charge , which produced a muzzle velocity of 2 @, @ 900 ft / s (880 m / s) . Wyoming and Arkansas were the only ships of the US Navy to receive the gun ; earlier dreadnoughts were equipped with the lower @-@ velocity 12 @-@ inch / 45 @-@ caliber Mark 5 gun . The Mark 7 had significantly better armor penetrating capabilities , owing to its higher muzzle velocity (and thus higher striking velocity) . At a range of 12 @, @ 000 yd (11 @, @ 000 m) , the gun could penetrate 12 @.@ 3 in (310 mm) of contemporary face @-@ hardened armor , compared to 10 @.@ 8 in (270 mm) for the Mark 5 . The guns were

mounted in the Mark IX gun turret , which allowed for elevation to 15 degrees and depression to -5 degrees . Unlike the turrets used on earlier dreadnoughts , the Mark IX turret required the guns to return to 0 degrees to reload .

The secondary battery consisted of twenty 5 inch / 51 caliber guns mounted in casemates along the side of the hull . These guns fired a 50 lb (23 kg) shell with a charge of 24 lb (11 kg) , at a muzzle velocity of 3 150 ft / s (960 m / s) . As was standard for capital ships of the period , they carried a pair of submerged 21 inch (530 mm) torpedo tubes in the hull on the broadside . They were equipped with the Mark III Bliss Leavitt design , which carried a 218 lb (99 kg) warhead and had a range of 4 000 yd (3 700 m) at a speed of 26 kn (49 km / h ; 30 mph) .

== Armor ==

The main armored belt , which was 8 ft (2.4 m) high , was 11 in (280 mm) thick over the central portion of the ship , where it protected the ammunition magazines and machinery spaces . The belt reduced to 5 in (130 mm) toward the stern . On the bottom edge it was reduced to 9 in (230 mm) . The forward end of the belt was connected with an 11 in thick transverse bulkhead with the forward most main battery barbette , while the aft end of the belt was connected with a 9 in bulkhead . The main armored deck was 2.5 in (64 mm) of special treatment steel , reduced to 1.5 in (38 mm) in less critical areas . The conning tower had 11 in (292 mm) thick sides and a 3 in (76 mm) thick roof .

The gun turrets had 12 in (305 mm) thick faces and 3 in thick roofs . Their supporting barbettes had 11 in thick sides where they were exposed ; the portions that were masked by the armored belt were reduced to 4.5 in (110 mm) . The lower half of the casemate armor was 11 in thick , and the upper half was reduced to 6.5 in (170 mm) . Inboard of the casemate battery were longitudinal armored bulkheads ; these were designed to protect the uptakes to the funnels . These were deemed important because during the Russo Japanese War , three years before , Russian battleships had had their uptakes damaged , which ducted the boiler smoke into the ship rather than out through the funnels .

== Modifications ==

Both ships were significantly modified throughout their careers . During and shortly after World War I , the horizontal armor of the ships was improved , including the roofs of the conning tower and the gun turrets . Their deck armor was increased to 3.5 in (89 mm) , and eight 3 inch (76 mm) / 50 caliber anti aircraft guns were installed . Following the signing of the Washington Naval Treaty in February 1922 , modernization work was strictly controlled . The treaty governed what modifications could be made to existing ships , and included restrictions on what could be changed or added . Displacement could rise by no more than 3 000 long tons (3 000 t) and no alterations of any kind could be made to the main battery guns or mounts . The primary areas that could be improved were those that concerned defense against aerial and underwater attack , along with propulsion systems .

The two Wyomings , along with the Floridas and New Yorks were heavily modernized in the 1920s . All six ships were converted to completely oil fired boilers with equipment taken from the cancelled South Dakota class battleships . The boilers were trunked into a single funnel . These boilers were much more efficient than the coal fired models the ships had been completed with , and they allowed a significantly greater cruising radius of 11 000 nmi (20 000 km ; 13 000 mi) . The ships were also fitted with anti torpedo bulges , which improved their underwater defense and also provided additional oil storage capacity . Wyoming and Arkansas lost their cage main mast , which was replaced by a short tripod mast that carried searchlights and radio antennas . Some of their secondary battery guns were relocated higher in the ship to improve their workability in heavy seas . A sponson for six guns was built into the hull abreast of the conning tower and the eight 3 inch anti aircraft guns were moved to the

top of the sponson . Both ships had their torpedo tubes removed .

Under the terms of the 1930 London Naval Treaty , Wyoming was to be demilitarized and converted into a training ship . During the demilitarization process , her anti @-@ torpedo bulges , side armor , and half of her main battery guns were removed . Wyoming was modernized at Norfolk Navy Yard from 12 January to 3 April 1944 ; the reconstruction removed the last of her three 12 @-@ inch gun turrets , and replaced them with four twin and two single enclosed mounts for 5 @-@ inch / 38 caliber guns . New fire control radars were also installed ; these modifications allowed Wyoming to train anti @-@ aircraft gunners with the most modern equipment they would use while in combat with the fleet . Modifications to Arkansas during World War II were kept to a minimum . In 1942 , Arkansas received a new tripod foremast and bridgework , along with more anti @-@ aircraft guns throughout the war . By 1945 , she carried nine quadruple 40 mm Bofors mounts and twenty @-@ eight 20 mm Oerlikons , and the number of 3 @-@ inch guns had been increased to ten .

= = Construction = =

= = Service history = =

After entering service , both ships were assigned to the Atlantic Fleet . The ships took part in the normal routine of training and fleet maneuvers off the east coast of the United States and in the Caribbean , interspersed with periodic maintenance . Both ships toured the Mediterranean in late 1913 , making stops in Italy and France , among others . In April 1914 , Arkansas was involved in the occupation of Veracruz during the Mexican Revolution , and Wyoming arrived later to support the operation . Two men from Arkansas won the Medal of Honor for their actions during the initial occupation of the city . After the United States declared war on Germany on 6 April 1917 , Wyoming , along with the rest of Battleship Division 9 (BatDiv 9) , steamed to Britain to reinforce the Royal Navy 's Grand Fleet , stationed in Scapa Flow . Arkansas initially remained in the United States , training gun crews for the expanding wartime fleet . In July 1918 , she too was sent to Britain . Neither ship saw action during the war , though they were present when the German High Seas Fleet surrendered in November 1918 .

From mid @-@ 1919 to mid @-@ 1921 , Arkansas and Wyoming served in the Pacific Fleet , with the latter serving as the flagship of BatDiv 6 . During this time , the ships made a tour of Central and South American countries , culminating in a visit to Valparaiso , where they took part in a naval review for the Chilean president . Both battleships returned in service with the Atlantic Fleet in mid @-@ 1921 . They returned to their peacetime routine of training and maneuvers and periodic maintenance . In the summers , the ships would generally take midshipmen from the US Naval Academy on training cruises . In June 1925 , Arkansas assisted relief efforts after the 1925 Santa Barbara earthquake . From late 1925 to late 1926 , Arkansas received her reconstruction , followed by Wyoming in 1927 . In 1929 and 1930 , Arkansas visited European waters on midshipmen cruises ; she made stops in several countries . Wyoming was reduced to a training ship in 1931 in accordance with the London Naval Treaty , and she spent the next decade conducting training cruises for midshipmen and NROTC cadets .

From early 1932 to early 1934 , Arkansas returned for another stint in the Pacific Fleet , followed by another tour of Europe later in the year . After the outbreak of World War II in September 1939 , she was assigned to the reserve force for the Neutrality Patrols . She supported the occupation of Iceland in July 1941 as an escort for the troopship convoys . In November , as it became increasingly apparent that the United States would become involved in World War II , Wyoming was reassigned as a gunnery training ship , a role she served in for the duration of the war . Arkansas , meanwhile , continued in front @-@ line service during the war , first as an escort to convoys to North Africa , and then as a shore bombardment vessel . She supported the landings at Normandy in June 1944 , shelling German positions at Omaha Beach , before bombarding Cherbourg later in the month . Her next bombardment mission came with Operation Dragoon , the invasion of southern France , in August that year . She was then transferred to the Pacific Theater of Operations for

action against the Japanese . She bombarded Japanese positions on Iwo Jima in February 1945 and on Okinawa in April .

With the end of the war in September 1945 , Arkansas was employed with Operation Magic Carpet , repatriating American soldiers in the Pacific . Wyoming remained in service briefly after the war , though she was decommissioned in August 1947 . She was sold for scrap in October and subsequently broken up . Arkansas was instead retained for use as a target ship during the Operation Crossroads nuclear tests in mid @-@ 1946 . She survived the first test , an air @-@ burst code @-@ named ABLE , though the second experiment , an underwater detonation code @-@ named BAKER , sank the ship .