

= Defence @-@ class ironclad =

The Defence @-@ class ironclads were a class of two warships built for the Royal Navy between 1859 and 1862 . The ships were designed as armoured frigates in response to an invasion scare sparked by the launch of the French ironclad Gloire and her three sisters in 1858 . They were initially armed with a mix of rifled breech @-@ loading and muzzle @-@ loading smoothbore guns , but the Armstrong breech @-@ loading guns proved unreliable and were withdrawn from service after a few years .

Both ships were initially assigned to the Channel Squadron , but HMS Resistance was transferred to the Mediterranean Squadron in 1864 . The ships were rearmed in the late 1860s after the completion of their first commission . They alternated between assignments with the fleet and guardship duties with the First Reserve for the rest of their careers . Resistance was the first to be paid off in 1880 and was used as a target for gunnery and torpedo trials beginning in 1885 . She was sold for ship breaking in 1898 , but wrecked en route to the breaker 's yard . HMS Defence was paid off in 1885 and she became a stationary training ship in 1890 until she was sold for scrap in 1935 .

= = Background = =

In 1859 the Admiralty was not yet convinced that the very expensive (£ 377 @, @ 000) Warrior @-@ class ironclads , which was over double that of wooden , steam @-@ powered ships of the line , had to be accepted as the norm . They noted that the 4 @. @ 5 @-@ inch (114 mm) armour plate of the Warriors was adequate to deflect all ordnance currently afloat , and high speed was not necessary to prevent existing wooden ships from massing their fire against the ironclads . Their Lordships therefore requested a design which , while carrying the same armour , was smaller and slower , and thus cheaper , than the Warriors . Rear Admiral Sir Baldwin Wake Walker , Controller of the Navy , proposed that six ships be built to this design , but he was over @-@ ruled and only two were ordered on 14 December 1859 .

The Admiralty 's decision saddled the Royal Navy with a pair of ships that could not operate with the Warriors in a tactical squadron and were inferior to the French ironclads then under construction . The naval architect Sir Nathaniel Barnaby , a future Constructor of the Navy , considered that a Defence @-@ class ship was worth one quarter of a Warrior in terms of combat , although they cost about two @-@ thirds as much .

= = Description = =

The Defence class was 280 feet (85 @. @ 3 m) long between perpendiculars and 291 feet 4 inches (88 @. @ 80 m) long overall . They had a beam of 54 feet 2 inches (16 @. @ 5 m) and a draught of 26 feet 2 inches (8 @. @ 0 m) . The ships displaced 6 @, @ 070 long tons (6 @, @ 170 t) and had a tonnage of 3 @, @ 710 tons burthen . Unlike their predecessors , they were fitted with a ram in the shape of a plough . The ends of the hull were subdivided by watertight transverse bulkheads and had a partial double bottom . Each ship had a complement of 460 (officers and enlisted men) . The Defence class was 128 feet 8 inches (39 @. @ 2 m) shorter overall and displaced more than 3 @, @ 000 long tons (3 @, @ 000 t) less than the Warrior @-@ class ironclads .

= = = Propulsion = = =

The Defence @-@ class ships had a single two @-@ cylinder trunk steam engine made by John Penn and Sons driving a single 21 @-@ foot (6 @. @ 4 m) propeller . Four rectangular boilers provided steam to the engine at a working pressure of 20 psi (138 kPa ; 1 kgf / cm²) . The engines produced 2 @, @ 329 ? 2 @, @ 343 indicated horsepower (1 @, @ 737 ? 1 @, @ 747 kW) during sea trials which gave the ships maximum speeds of 11 @. @ 23 ? 11 @. @ 4 knots (20 @. @ 80 ?

21 @. @ 11 km / h ; 12 @. @ 92 ? 13 @. @ 12 mph) . They carried 450 long tons (460 t) of coal , enough to steam 1 @, @ 670 nautical miles (3 @, @ 090 km ; 1 @, @ 920 mi) at 10 knots (19 km / h ; 12 mph) .

The ironclads were barque @-@ rigged and had a sail area of 24 @, @ 500 square feet (2 @, @ 276 m²) . The lower masts and bowsprit were made of iron to withstand the shock of ramming . Both ships could make about 10 @. @ 5 knots (19 @. @ 4 km / h ; 12 @. @ 1 mph) under sail alone . To reduce wind resistance while under sail alone , the funnel was semi @-@ retractable . Similarly , the propeller could be hoisted up into the stern of the ship to reduce drag while under sail .

= = = Armament = = =

The armament of the Defence @-@ class ships was intended to be 18 smoothbore , muzzle @-@ loading 68 @-@ pounder guns , eight on each side on the main deck and one each fore and aft as chase guns on the upper deck , plus four Armstrong 40 @-@ pounder guns , an early rifled breech loader (RBL) design , as saluting guns . The 8 @. @ 12 @-@ inch (206 mm) 68 @-@ pounder weighed 10 @, @ 640 @-@ pound (4 @, @ 826 @. @ 2 kg) and had a range of 3 @, @ 200 yards (2 @, @ 900 m) with solid shot . During construction the armament was changed to include six (Defence) or eight (Resistance) rifled 110 @-@ pounder guns , ten 68 @-@ pounders and either two 32 @-@ pounder smoothbores (Resistance) or four breech @-@ loading 5 @-@ inch (127 mm) guns (Defence) . The innovative 9 @, @ 520 @-@ pound (4 @, @ 318 @. @ 2 kg) 110 @-@ pounder , whose 7 @-@ inch (178 mm) shell could reach 4 @, @ 000 yards (3 @, @ 700 m) was in short supply when the ironclads were launched , but poor results in armour @-@ penetration tests halted plans to fully equip the ironclads with this gun . The 110 @-@ pounders blew up when other ships used them in action , were labour @-@ intensive to load and fire , and were henceforth only used with a reduced propellant charge , which left them useless in practice .

Both ships were rearmed in the late 1860s with 14 seven @-@ inch and 2 eight @-@ inch rifled muzzle @-@ loading guns . The new guns were heavier so fewer could be carried . On both ships the eight @-@ inch guns were mounted amidships on the main deck on the broadside and a pair of seven @-@ inch guns were mounted on the upper deck as fore and aft chase guns . Eight of the remaining seven @-@ inch guns were also placed on the main deck on the broadside where they were protected by the ship 's armour , but one pair was on the main deck further aft where they were not protected by armour . The two ships differed where the last pair of seven @-@ inch guns was positioned : Defence mounted them on the main deck , forward of the armour , while Resistance mounted hers on the upper deck .

The shell of the eight @-@ inch (203 mm) weighed 175 pounds (79 @. @ 4 kg) while the gun itself weighed 9 long tons (9 @. @ 1 t) . It had a muzzle velocity of 1 @, @ 410 ft / s (430 m / s) and was credited with the ability to penetrate 9 @. @ 6 inches (244 mm) of wrought iron armour at the muzzle . The 6 @. @ 5 @-@ long @-@ ton (6 @. @ 6 t) seven @-@ inch gun fired a 112 pounds (50 @. @ 8 kg) shell and could penetrate 7 @. @ 7 @-@ inch (196 mm) armour . All of the guns could fire both solid shot and explosive shells .

= = = Armour = = =

The Defence @-@ class ships had a wrought iron armour belt , 4 @. @ 5 inches (114 mm) thick , that covered 140 feet (42 @. @ 7 m) amidships . The armour extended from upper deck level to six feet (1 @. @ 8 m) below the waterline . Transverse bulkheads 4 @. @ 5 inches thick protected the guns on the main deck from raking fire . The armour was backed by 18 inches (460 mm) of teak . The ends of the ship were left entirely unprotected which meant that the steering gear was very vulnerable . They were , however , sub @-@ divided into many watertight compartments to minimize any flooding .

= = Ships = =

= = Service = =

HMS Defence was assigned to the Channel Squadron upon completion in 1862 . The ship was paid off in 1866 to refit and be re @-@ armed and was briefly reassigned to the Channel Squadron again when she recommissioned in 1868 . Defence had brief tours on the North American and Mediterranean Stations , from 1869 to 1872 before she was refitted again from 1872 to 1874 . She became guard ship on the Shannon when she recommissioned . The ship was transferred to the Channel Squadron again in 1876 and then became guard ship in 1879 on the Mersey until 1885 . Defence was placed in reserve until 1890 when she was assigned to the mechanical training school at Devonport in 1890 . She was renamed Indus when the school adopted that name and served there until sold in 1935 .

HMS Resistance was the first capital ship in the Royal Navy to be fitted with a ram and was given the nickname of Old Rammo . She was initially assigned to the Channel Squadron , but was transferred to the Mediterranean Squadron in 1864 , the first ironclad to be assigned to that squadron . Resistance was rearmed in 1867 and became a guardship when recommissioned in 1869 . The ship was reassigned to the Channel Fleet in 1873 before reverting to her former duties in 1877 . Resistance was decommissioned in 1880 and was used for gunnery and torpedo trials beginning in 1885 . The ship was sold for scrap in 1898 and foundered the following year en route to the breaker 's yard . Her wreck was salvaged and later scrapped .