

**THE NEW UNITED STATES CRUISERS.**

In our two-page plate, and on the present page, we give illustrations of the new armoured and protected cruisers which have been designed by Rear-Admiral Philip Hichborn, the Chief Constructor to the United States Navy.

It will be remembered that in our issue of the 25th of January last we illustrated and described the new United States battleships of the Virginia and Rhode Island class, to which publication that which we now give forms a continuation. It will also be remembered that in our account of the last meeting of the American Society of Naval Architects and Engineers we referred to an important paper by the Chief Constructor of the United States Navy, in which the new vessels were very fully dealt with.

It may be said here with regard to the battleships already illustrated, of which five are to be built, Admiral Hichborn points out in his paper that they will carry the heaviest battery afloat. Compared with

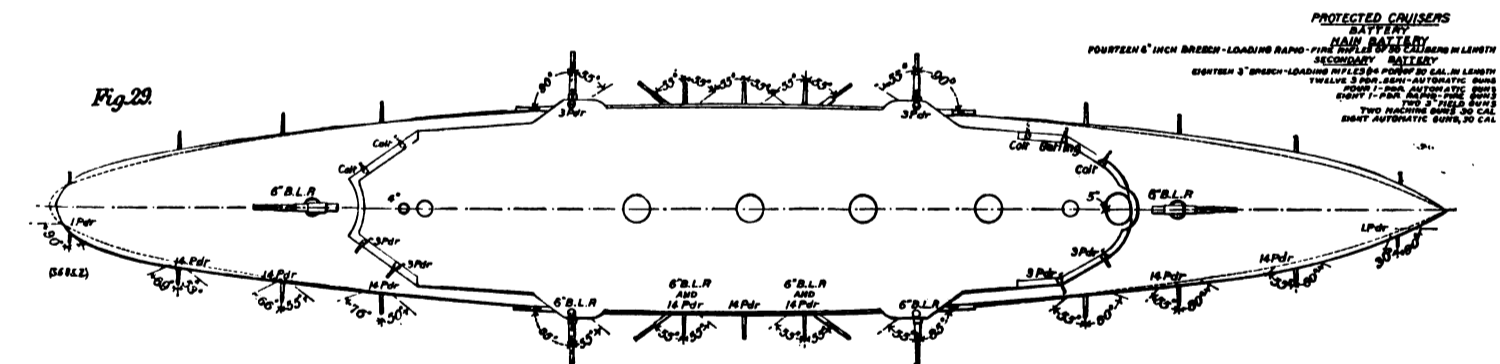
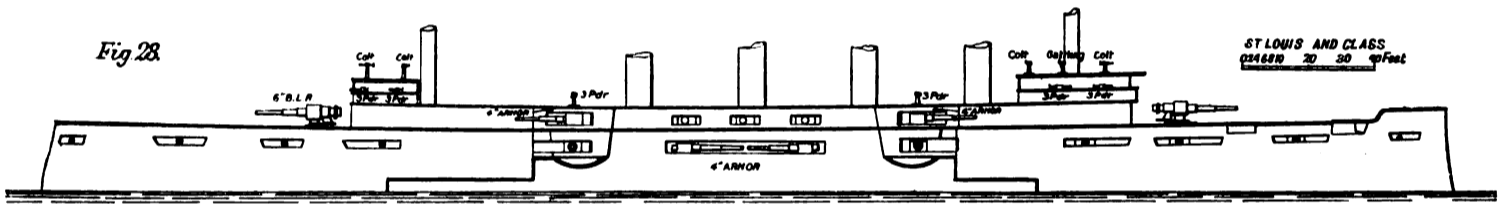
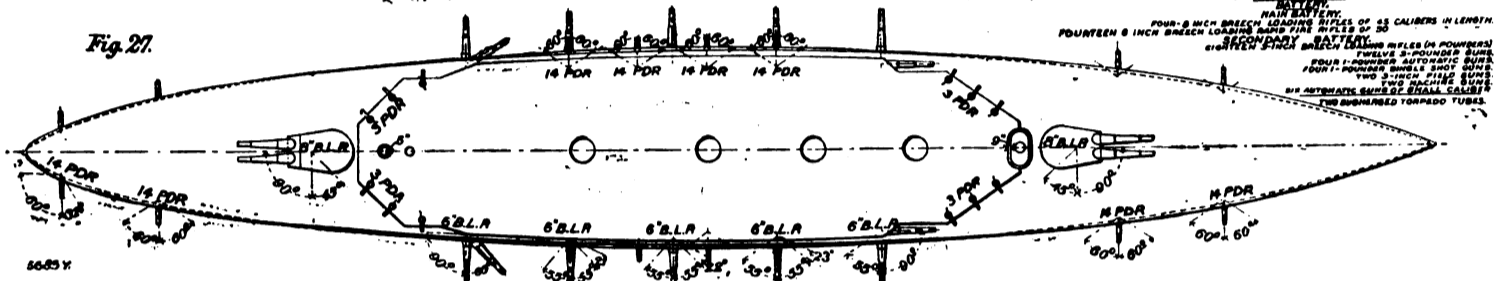
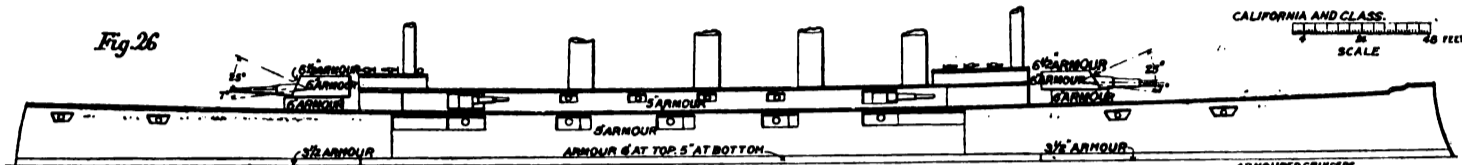
thirds ammunition and stores on board, so that it is possible were the Venerable's figures to be given under like conditions, we should see a preponderance of "capital" at the American designer's disposal that would give a distinct advantage. In regard to other features of the two designs, it may be added that the American ship has 19,000 horse-power against 15,000 for the British vessel, and this will make a difference of a knot in speed. The normal coal is 900 tons in each; but the Venerable has a slight advantage in bunker capacity. The maximum thickness of armour is 11 in. in the American and 9 in. in the British ship; but, naturally, without knowing the area protected by varying thicknesses, this tells very little. We have, however, four submerged torpedo-tubes, as against two of the American—whatever that may be worth.

Turning to the vessels more immediately under notice, in Fig. 15, on our two-page plate, we give a sectional profile view of the armoured cruiser Maryland; whilst Fig. 16 is a plan on different planes, as

to the main deck. Transverse armour 4 in. thick will be worked at the ends of the 5-in. side armour, thus forming a central casemate for ten 6-in. guns. The main belt will be 387 tons; the taper belt at the ends 261 tons; the upper and lower casemate side armour, 674 tons; and the transverse casemate armour, 220 tons. With other armour, bolts, backing, and 100 tons of cellulose, the total weight devoted to protection will be brought up to 2219 tons.

The rate of supply of ammunition to the 8-in. turret hoists is one round every fifty seconds; and for the 6-in. guns, three complete rounds a minute. The weights of the armament are as follows:

	Tons.
Four 8-in. guns ... ..	72.0
" " mounts ... ..	43.2
Fourteen 6-in. guns ... ..	114.2
" " mounts ... ..	70.0
" " shields ... ..	23.1
Eighteen 14-pounder guns and mounts ...	45.0
Twelve 3-pounder guns and mounts ...	8.5
Torpedo outfit ... ..	24.0



our own battleships of the Venerable class, they have in their main armament an addition of eight 8-in. guns. Thus, H.M.S. Venerable and the U.S.S. Virginia have both four 12-in. breechloading rifled and twelve 6-in. quick-firing guns; but the American ship has, in addition, the eight 8-in. breechloading rifled guns. We state this as an isolated fact, and not as by any means summing up the merits of the two vessels, for we know that a warship is necessarily a compromise; and, moreover, a ship built for one purpose—or one power—may be safely stronger in one particular than that constructed for another purpose—or power. Our own Government is so chary in giving information to the public that comparisons are impossible; all one can say is that eight 8-in. guns are an enormous addition to the offensive powers of any battleship, and there must be very striking advantages in other respects contained in the British design to counterbalance such a preponderance as is here shown in favour of the American ships.

The first thing one naturally looks to is displacement, "the capital at the disposal of the naval architect," and here our first uncertain factor arises. The American, though 35 ft. longer and about 1½ ft. wider than the British vessel, is 2 ft. 9 in. less in depth. What may be the block coefficients of the two ships we do not know, and the displacement of the Virginia is given at 14,600 tons, whilst that of the Venerable is 400 tons more, or 15,000 tons. The American ships' draught and displacement, however, is with two-

marked on the drawing. Figs. 17 to 25, also on the two-page plate, give half sections at various frames, as numbered. Fig. 26, on the present page, is a profile view of the armoured cruiser California, and Fig. 27 is a deck plan showing the position of the armament. These two ships belong to a group of six which are identical in dimensions, interior arrangements, and batteries, the only variation being that three are sheathed with wood and coppered (the West Virginia, Nebraska, and California), whilst the other three (the Maryland, Colorado, and South Dakota) are unsheathed. It will be noticed that the Virginia is a battleship, whilst the West Virginia is an armoured cruiser.

Figs. 28 and 29 on the present page are respectively a profile view and a deck plan of the protected cruiser St. Louis; the Milwaukee and Charleston being sister ships.

The chief elements of design of these cruisers are given in the Table on the next page.

The tabulated data give so much information, together with the drawings, that there is little to add. It may be stated that in the California and Maryland the 7 ft. 6 in. water-line belt extends the whole length of the vessel. For about 244 ft. abreast of the engines and boilers it consists of 6-in. armour for 4½ ft. from the upper edge, after which it tapers to 5 in. at the lower edge. At the bow and stern it is 3½ in. thick. Above the main belt there will be 5 in. armour for a length of 232 ft. extending vertically

Other items of armament bring the total weight to 407.5 tons.

The weight of ammunition, &c., will be as follows:

	Tons.
Five hundred rounds 8-in. ammunition complete ... ..	91.5
Two thousand eight hundred rounds 6-in. ammunition complete ... ..	227.5
Four thousand five hundred rounds 14-pounder ammunition complete... ..	51.7
Six thousand rounds 3-pounder ammunition complete ... ..	22.4
All other ammunition ... ..	18.8
Store and outfits ... ..	20.0
	432.0

The propelling machinery will consist of two sets of four-cylinder triple-expansion engines to drive the twin screws; the combined horse-power being 23,000, or 2000 horse-power less than the legend power of our own big cruisers, the Powerful and Terrible, and 7000 horse-power less than our more recent armoured cruisers of the Drake class. These latter vessels are about the same length as the American ships, but are 71 ft. wide and have a displacement of 14,100 tons. The Blake is designed for 23 knots, and carries two 9.2-in. and sixteen 6-in. guns, besides guns of a smaller nature. She has also 6-in. side armour and 12-in. to 12½-in. armour for bulkheads and gun positions. As already stated, however, incomplete details do not

DIMENSIONS AND ARMAMENT OF THE NEW UNITED STATES CRUISERS.

	"California" (Sheathed).	"Maryland" (Not Sheathed).	"St. Louis."
Length on low-water line .. .. .	502 ft. 0 in.	502 ft. 0 in.	424 ft. 0 in.
" over all .. .. .	504 " 9 "	504 " 9 "	428 " 6 "
Breadth moulded .. .. .	69 " 4 "	69 " 4 "	65 " 2 "
" extreme .. .. .	70 " 0 "	69 " 6 "	66 " 0 "
Draught, mean .. .. .	24 " 6 "	24 " 6 "	23 " 6 "
Corresponding displacement	18,800	13,400	9700, with 650 tons coal
Freeboard, forward .. .. .	23 ft. 0 in.	23 ft. 0 in.	21 ft. 0 in.
" aft .. .. .	21 " 6 "	21 " 6 "	19 " 11 "
" amidships .. .. .	18 " 0 "	18 " 0 "	17 " 8 "
Speed in knots .. .. .	22	22	22
Indicated horse-power, total .. .. .	23,000	23,000	21,000
Area amidship section, square feet .. .. .	1607.2	1575.0	1445.6
Area load water plane, square feet .. .. .	24,500	24,020	18,638
Tons per inch immersion (load water line) .. .. .	58.31	57.7	44.5
Moment to alter trim 1 in., foot-tons .. .. .	1490.5	1470	980
Wetted surface, square feet .. .. .	42,843	42,430	23,000
Rudder area, square feet .. .. .	259.4	259.4	200
Maximum helm angle, degrees .. .. .	38	38	38
Mean draught (with all stores, provisions, ammunition, and coal)	26.6 (1900 tons coal)	26.6 (1900 tons coal)	25.6 (1500 tons coal)
Corresponding displacement, tons .. .. .	15,200	14,875	10,772
<b>Armament.</b>			
Main battery .. .. .	Four 8-in. B.L.R. Fourteen 6 " " " "		Fourteen 6-in. Q.-F.
Secondary battery .. .. .	Eighteen 14-pdr. Q.-F. guns Twelve 3-pdr. Q.-F. guns Four 1-pdr. automatic guns " 1-pdr. Q.-F. guns Two machine guns Six Colt automatic guns Two 3-in. Q.-F. guns Two submerged		Eighteen 14-pdr. Q.-F. guns Twelve 3-pdr. semi-automatic Four 1-pdr. automatic Eight 1-pdr. Q.-F. guns Two 3-in. field guns Two machine Eight automatic
Torpedo tubes .. .. .			
<b>Armour.</b>			
Water-line belt thickness amidships { Top .. .. .	6 in.		4 in.
" Bottom .. .. .	5 in.		
Height of upper edge above normal water-level .. .. .	2-ft. 4-in.		3-ft. 3-in.
Total depth of belt .. .. .	7 " 6 "		7 " 6 "
Thickness of casemate { Upper .. .. .	5-in., transverse 4-in.		4 in.
" Lower .. .. .	5-in.		
Gun protection .. .. .	8-in. gun, 6½-in. and 6-in.		4 "
Turret, maximum and minimum thickness .. .. .	8-in. gun, 6-in.		—
Barbette .. .. .	4-in.		3 "
Protective deck { Slopes .. .. .	1½ "		2 "
" Flat .. .. .	9 "		5 "
Conning tower .. .. .	9 "		4 "
Signal tower .. .. .	5 "		—
<b>Estimated Weights.</b>			
Hull and fitting, including wood backing, sheathing, and coppering, protective deck plating, &c. .. .. .	7441.56 tons	7041.56 tons	5345.8 tons
Armour and bolts .. .. .	2019		755
Armament and ammunition, full supply .. .. .	289.5 tons		643.1 tons
Equipment, miscellaneous stores and water, full supply .. .. .	626 "		488.6 "
Propelling machinery and water .. .. .	2135 "		1900 "
Normal coal .. .. .	900 "		650 "
Bunker capacity .. .. .	2000 "		1500 "
Officers, crew, and effects .. .. .	89.65 "		78.6 "

official in the firm. When the offer was made, it was refused, because the firm was connected with the Midland Wages Board. The Iron and Steel Workers' Union repudiated the action taken, as being in violation of the rules and regulations of the Board. Happily all ended well. Both parties—the firm and the Association—were loyal to the Wages Board, an evidence at once of its salutary influence. It is pointed out to the men that, however well meant their action, the reduction officially made by the Board, 7½ per cent., was within 2½ per cent. of the unofficial offer, the former being the regular mode of procedure, while the latter was irregular and likely to lead to disaster by undermining the influence of the Board and destroying all faith in the sliding scale arrangement. The matter is to be allowed to drop by the Board and Association with a reprimand passed at a public meeting of the workmen.

The report of the Ironfounders for the current month is not encouraging from the union's point of view. It tells of a decrease in the balance in hand of 604/ 11s., and of a decrease of members; side by side there is an increase of 58 on the funds. The decrease in funds is mainly attributed to the contribution to the Trades Federation, and to the increase of unemployed on donation benefit; the latter by reason of holidays and a decline in trade. A continuance of this decline is anticipated. As regards the number of members on the funds, there were 1081 on donation benefit, increase of 72; but as against this there were 133 out of work, but out of benefit, also a decrease of 14; on sick benefit 479, decrease three; on superannuation benefit 917, increase 11; and on dispute benefit six, decrease eight; total on the funds 2616, as against 2558 last month. The returns relating to the state of trade are not of so agreeable a character as for a long time they have been, for in no case is it reported that trade is improving in any locality. In 92 places, with 12,406 working members, trade was from very good to moderate; last month this description applied to 97 places, with 13,791 members. In 35 places with 5824 members, trade is described as declining, through the several grades down to very bad; last month this applied to 29 places with 4556 members. These figures tell their own tale of declining trade with the natural sequence of an increase of unemployed members. The total cost of benefits was equal to about 11½d. per member per week for the four weeks, the cost being 871/ 7s. per week. The cash balance in hand was 106,443/ 11s. 7d., as compared with 92,541/ 6s. 5d. in February, 1900. But at that date the balance was increasing, now it is decreasing. The levy of 3d. per member to the Calais Laceworkers was carried by an overwhelming majority, and 160/ was at once remitted to the strike committee. One noticeable indication of the downward condition of trade is the decrease in the arrears of members; they begin to perceive that employment is growing slack, and that arrears means suspension of benefits.

The report of the Amalgamated Society of Carpenters and Joiners for the current month announces that after a considerable experience of improved conditions of labour in various parts of the country, the members are beginning to experience the reverse side of reductions in wages, or of attempts thereat. The total number of members was 65,385 on the 1st inst. Of these 2878 were on unemployed benefit, 1416 on sick benefit, and 949 on superannuation benefit. The increase of unemployed shows the trend of trade. There are three lock-outs reported, in each case because the members resisted a reduction in wages. The places are Blackpool, St. Anne's-on-the-Sea, and Glasgow. In the latter district a large number of shops are closed against members of the union. Disputes also exist at Belfast, Bridlington, Coventry, Cromer, and Dover; members are also given to understand that at thirteen other towns they are required to see the branch secretary before accepting work. As a set-off to the more unsettled state of affairs at home, members are informed that a prosperous condition of trade is reported in the United States, and in the Australian Colonies, so that in resisting reductions in wages in the United Kingdom they will have the support of the countries named. At Halifax the members have succeeded in obtaining the employers' signatures to improved working rules, thus ending the dispute in that town. At St. Helens the lock-out has been withdrawn, and the men have resumed work on terms satisfactory to them as regards the foreign joinery question. The publication of a list of firms supplying such joinery on fair trade terms seems to have assisted in promoting a better understanding. Employers learn from that list the names of firms where joinery can be obtained without causing disputes as to the fixing thereof. Members are cautioned in a kindly way about the new federation, called "The Northern Counties Building Trades' Federation," about which the Amalgamated Society has not been consulted. If labour troubles arise by the action of that federation, the union cannot be held responsible for funds to carry on any dispute.

give a fair measure of the fighting efficiencies of war vessels.

The steam pressure in the engine of the California and Maryland and the four sister ships will be 250 lb., and the revolutions 120 per minute. There will be 30 water-tube boilers, with approximately 1590 square feet of grate, and about 68,000 square feet of heating surface. The enormous area devoted to the steam generating plant of these modern high-powered vessels will be gathered from the plan, Fig. 16. The electric plant will weigh 158.7 tons.

In regard to the smaller protected cruiser, the St. Louis, of which very full details are given in the Table, the main belt will weigh 219 tons; the lower casemate 187 tons; and the upper casemate 204 tons. The total protection will weigh 854 tons. The ammunition will weigh 643 tons. There will be 16 water-tube boilers with 1400 square feet of grate, and 58,800 square feet of heating surface. The electric plant will not exceed 123 tons. These cruisers of the St. Louis class compare most closely with our own Monmouth; the latter, however, having a small advantage in size, though not so powerful as the American ships in weight of metal discharged in a given time.

From the few particulars here given, it will be seen that whatever may be the respective merits of these American vessels compared to similar craft of other countries, Admiral Hichborn and his colleagues have succeeded in designing some very formidable craft, which cannot fail to add to the prestige and efficiency of the already splendid ships possessed by the United States.

INDUSTRIAL NOTES.

In the Ironworkers' Journal for the current month there is a review of the North of England iron and steel trades for the past year, mainly from the industrial or workmen's standpoint. Prices rose for raw and finished material to a higher level than was ever reached in the years 1871-74, and they so remained for a longer period. Then pig iron declined, soon to be followed by a decline in other prices in proportion. Singularly enough the decline in volume preceded the decline in prices, so that over-production was not the cause. It is stated that the output in 1900 was not so great as in 1899—either in pig or manufactured iron. There was a decrease in shipments, both coastwise

and to foreign countries, so that the demand fell off, though stocks did not largely increase for some time, if at all, indeed, to any large extent, except, perhaps, recently. Even now, at the date of the report, February 1, "stocks are still very low," it is reported. The fall in prices is, to some extent, attributed to foreign competition; but it is stated that the decline was greater than the actual circumstances warranted. The report anticipates that the production during the current year will be less than in any year since 1895, which was the lowest since 1889, according to Mr. Waterhouse's returns to the Conciliation Board. The net settling prices (averages) rose from 7/ 6s. 10.51d. per ton in January and February, and then fell to 8/ 5s. 2.48d. per ton in November and December. But, then, the price in November and December, 1899, was only 6/ 17s. 10.27d. per ton. The report alludes to the high dividends of some of the great companies; in one case 50 per cent., as compared with 33½ per cent. in 1899. Reference is made to the activity in the great iron and steel using industries, such as engineering and allied trades, shipbuilding, and all locomotive and other railway work. In some of these there is still a large amount of work on hand.

As regards wages, the report says: "Wages in nearly all departments have increased rapidly." The iron and steel workers had, by the sliding scale, advances amounting to 17½ per cent. in 1900, in addition to 12½ per cent. obtained in 1899. The Consett steelworkers' wages went up 32½ per cent. above the lowest point, or 25 per cent. above the standard basis. Blast-furnacemen's rates went up to 46½ above the standard, an advance of 18 per cent. Ironstone miners' wages went up to 51½ above the standard rate, or an advance of 11½ per cent. The Durham miners obtained 31½ per cent. in 1900, carrying the rates to 65 per cent. above the standard basis. Those comparisons are well timed, as a decline has set in, the men will see how they have advanced with prices, and the figures will help to reconcile them to the fall in rates consequent upon the fall in prices.

One very singular affair is reported and commented upon in this month's journal. It appears that some of the workmen in a Shropshire firm had been led to make an offer to the employers of 10 per cent. reduction, at the unofficial suggestion, it is said, of an