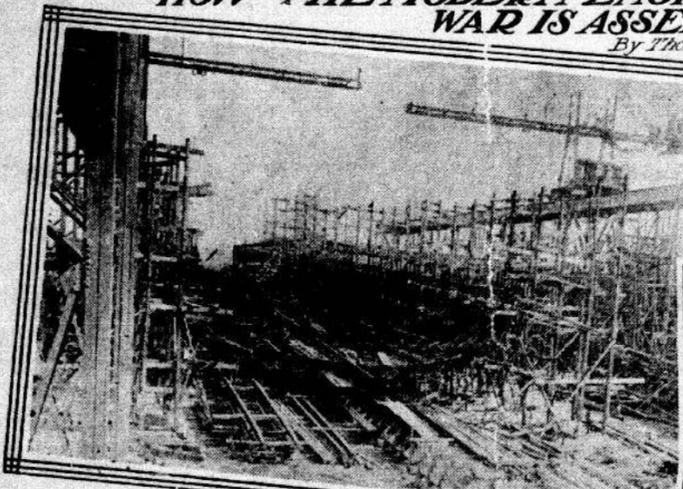


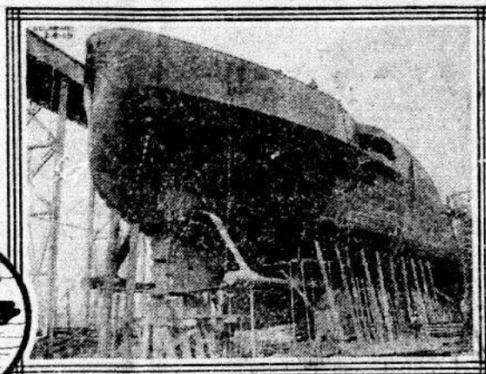
THE BUILDING of a BATTLESHIP

HOW THE MODERN ENGINE OF WAR IS ASSEMBLED

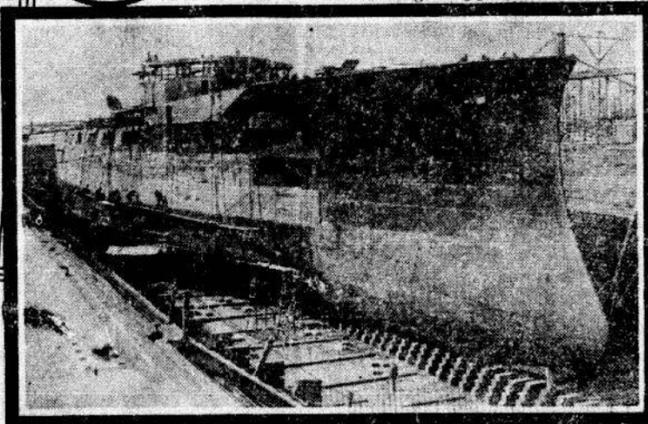
By Thomas Wilson



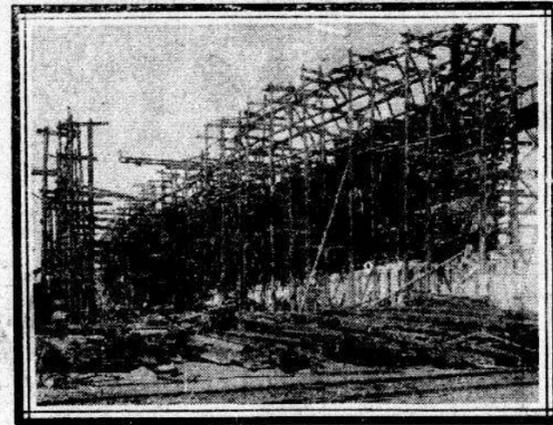
Laying Keel and Frames



View from Aft Showing Supports



In the Drydock after the Launching



Placing the Plates

OF THE millions of people living far inland in this country who have never seen one of the great fighting ships of our navy, save in pictures, few can appreciate the vast amount of time and labor involved in the construction of one of these modern vessels; indeed, those who live within a few miles of the coast hardly realize what it means, and to the average person three years for the building of one of these floating fortresses seems like an exceptional time when it is taken into consideration the rapidly with which huge skyscraping buildings are erected.

In the battleship, however, not only do all the elements of the construction of an edifice ashore enter, but there are all the elements of building for the sea, ever a prodigious feat in itself, but this vessel must be an embodiment of even more.

First it must be a craft so designed as to be seaworthy and speedy. Secondly, it must be the home of 1,000 or more men who form the crew. It must have the necessary apartments for the officers, with a spacious office for the commanding officer, and should she be intended at any time for a flagship, apartments for the commander of the fleet must be provided.

This alone represents practically all the features of a hotel ashore except that, for lack of space and facilities afloat, everything must be condensed into as small a space as possible. After this comes the subject of weapons and the heavy belt of armor that plates her sides and makes the ship a fighting vessel fully capable of engaging with equal chances any other vessel of similar size and equipment.

A battleship is born, not in a shipyard, as many suppose, but in the drafting rooms of the navy department.

The first lines of the vessel are of the hull, the number of tons of displacement having already been provided for in a proper bill that has been passed by congress. To the members of the navy board is left the settlement of the question of length, breadth and depth which will give the necessary tonnage.

Working on the basis that a vessel is to be so many feet long, so many feet wide and so many feet deep, the requisite lines are drawn to prescribe the shape of the vessel. After the lines have been examined a model is made from them. This model is made of wax, upon a scale of so many inches to the foot, and is as accurate as it is possible to make it.

Then follows the trying of the model. In a huge tank of water and with mechanism of special make, the model is towed rapidly from one end of the tank to the other, while experts watch the waves. By these waves can be told whether the lines are too full for high speed or whether they are just right.

To get the speed lines just right sometimes requires that the model be changed again and again by shaving off a little wax here and there or by adding a little more where the lines are thought to be too fine. This testing tank of the navy department is one of the most interesting features of the bureau of construction, and it is believed that this country possesses the finest equipment of this kind ever made.

When the waxen model has been judged to be perfect a set of lines are then made from it, and upon these lines is the foundation of the great ship that is to be built.

While all this is being done the greatest of all questions—that of armament—is being discussed. How many guns and of what caliber shall they

be, and what shall be the thickness of the armor belt, are questions that are problems indeed, but in course of time they are disposed of, and in the drafting room the men take up the designing of the vessel to meet the requirements of the fighting equipment.

In the plans of a warship, as in the plans of a large building, nothing is left to guesswork. Everything is planned and there is a drawing for everything. There is not a rivet but what is shown, and from the huge smokestacks to the lowermost part of the keel there is absolutely nothing but what has been provided for.

The division of the space within the hull, the parts of the ship that are to be set aside for living quarters, coal bunkers, water tanks, main engines, auxiliary engines, refrigerating plant, laundry, etc., are all carefully studied and provided for until the whole ship, including everything except coal, water, provisions and the crew, is on paper.

There are drawings showing the vessel as she will appear as a whole—the profile—drawings of the various cross sections at various points from the bow to the stern showing the plate steel work. Then there are similar plans that show the interior arrangements, a mass of paper that weighs hundreds of pounds and represents an outlay of thousands of dollars.

Besides the plans there are speci-

fications, hundreds of typewritten pages giving, in minute detail, descriptions of everything, wood or metal, that enters into the construction of the vessel. This data, after being revised over and over, is finally printed, and makes up a volume of considerable size.

This might be called the preliminary work, for all this is done even before the contract is let. When the bids have been received and the contract is signed begins the actual building of the vessel, which is none the less interesting than the designing.

A shipyard where a first-class fighting ship is built is a marvel in itself, and the splendidly equipped establishment at Newport News, the natal place of so many of our finest vessels, is a city within itself, where several thousand men, representing a score or more trades, find employment.

When the hundreds of sheets of plans have been received in the office they are divided among the various craftsmen, who will each do their share of the vast work. The greater number of the plans are sent to the pattern shop, where they are fashioned full-sized models of the pieces of metal that enter the construction of the hull. Other plans are sent to the rolling mills, where the pattern makers do likewise, until at the different pattern shops there are cut out of light wood the exact size and shape of the ship.

These wooden models are then sent

to the steel workers, who, with forge, lathe and trip hammer, make in duplicate of the wooden pieces huge pieces of metal, each pierced with the requisite number of holes, so that they may be fastened together without loss of time.

It is really marvelous how great slabs of steel, many inches thick, are rolled and pounded into shape to fit one to the other with absolute exactness so that the holes in one correspond with the holes in another. The plates for the hull, under the water and above the armor belt, are gotten out in one part of the mill, while the smaller pieces, stringers, bolts, etc., are gotten out in another part. Perhaps the conditions are such that three or four mills in different parts of the country are working at the same time, each mill having its share.

In the meantime the shipyard hands are not losing any time. Whatever part of the work that can be done there, in the forges, in the joiner mill, or in other departments, is being carried on as rapidly as possible under cover.

Out in the yard, at the spot selected for the erection of the vessel, the railway gang is busy. Between two high, long steel piers, on which are far-reaching traveling cranes, the blocks on which the keel of the ship will rest are placed. Great timbers, 12 inches square, are first laid lengthwise to

form a platform on which, in pyramid fashion, are laid crosswise the keel blocks. Beginning these blocks near the water the foundation is carried inland on a rise until it terminates where the bow of the vessel will be.

In giving out the work arrangements are made for the receipt of the material. Every piece of metal or wood is given a number to represent the number of the battleship, so an soap are known by numbers before they are named, in addition to which each piece is given a serial number so that there will be no mistake in the assembling.

By the time the keel blocks have been prepared the first of the steel, the keel and frames, arrive. Picked up by the long-armed cranes, the pieces of steel are swung through the air and laid on the keel blocks. Then begins the work of construction in earnest. A dozen portable forges, a score of pneumatic hammers and half a hundred men are engaged putting down the piece of the keel and the section of the frame or rib. From that moment the work goes on apace, man after man is added to the force and hit by hit the keel extends and the great ribs rise.

As the ribs extend forward and upward carpenters erect the staging around the vessel until it is increased in a network of timber. With the advance of the framing the platers take up the work, and piece by piece the steel covering is riveted in place until the ship takes shape and stands a metal shell.

By this time fully 1,000 men are at work on the craft, some inside and some outside, while there are others in the shops. Just how many men's labor goes into the building of a battleship is difficult to say—probably 20,000 indirectly—but the work is so divided that there is something almost automatic about it.

One phase that must not be overlooked is the inspection, or supervision, maintained by the government. At the yard is a naval constructor, who has a staff of men whose duty it is to inspect every piece of material that goes into the vessel, and see that it is as prescribed in the specifications. It is also his duty to compute at various times the percentage of the vessel completed, and his reports upon this subject is further evidenced by photographs.

To the naval constructor is referred all things that are in doubt in regard

to the plans and specifications, for he is the personal representative of the navy department.

Unless the vessel reaching certain percentages of completion the builders receive a proportionate percentage of their money, so it is to their advantage to get the ship built as soon as possible. Delays are costly, for the government usually exacts a penalty for failure to complete within a specific time.

At last comes the day when the ship is ready to take to the water. The hull is complete. The staging is taken down and the vessel is revealed, grim and gaunt, but majestic in its very size.

Clatter, clatter go the hammers on the wedges; chir-r-r, chir-r-r sing the saws; there is a rending of wood, a female voice rings out, "I name this vessel," there is a crash of breaking glass and 10,000 tons of steel slides into the water with a splash.

Then the ship is placed in a drydock, and after a thorough painting is refloated, placed upon giant shears and its boilers and engines lowered into it. All the while mechanics of every trade, carpenters, plumbers, machinists, experimenters, blacksmiths and others have taken up their work on board.

Their respective tasks completed to the satisfaction of the naval constructor, the vessel is ready for her trial under her own power. In the hands of the competent force of the shipyard the vessel is put under steam, the hawsers are cast off and she makes her first trip to try her out.

Any little defects in her machinery are remedied, and then when she has been inspected thoroughly by the builders, the navy department is notified, and officers and crew are sent to the yard. Then follow the various tests—dashes over a mile course and a 24-mile run at sea—to determine whether she is all that her plans indicated that she would be. If she is not, then the builders take her in hand and make her so, but, as a general rule, the vessels are not only up to the required mark in speed, but a little more.

Then follows the last ceremony at the builder's yard and the first of the vessel's deck—the raising of the flag at the afterstaff as the vessel goes into commission and she takes her place in the list of the nation's floating bulwarks.

WASHINGTON NEWS

THE MISSOULIAN'S SPECIAL SERVICE

Washington, D. C., Sept. 25.—The treasury department has designated the First National bank of Minneapolis, as the reserve agent for the First National bank of Yaller, and the Continental National bank of Chicago, as reserve for the Silver Bow National bank of Butte.

The department has approved the election of the following officers of the First National bank of Polson: J. L. McIntire, vice-president; A. W. Pipes, cashier, in place of W. L. Carver; John M. Gordon, assistant cashier.

Citizens of Missoula will have plenty of opportunities to enter the government service this winter if they so desire as the Civil Service commission will conduct a number of examinations next month in the Montana city. Timber testing engineers at salaries ranging from \$900 to \$1,200 are wanted for duty at Boulder, Colorado, Seattle, Washington, and Berkeley, California, and examinations to secure them will be held on October 20th. Female domestic science teachers are needed at the Santa Fe, N. M., Indian school, and an examination will be held on October 20 and 21. The position pays \$50 a month. Agricultural teachers for the Carlisle, Pa., Indian school, will be sought in an examination on October 20th, the place paying \$800 per annum. On October 29 and 31 examinations will be conducted to secure mechanical draftsmen in the patent office at Washington at \$1,000 a year. On the same days an examination for highway engineers for the good roads service at from \$1,200 to \$2,250 a year will be held.

At Yellowstone, Montana, recently, Private A. E. Webb, of the cavalry, located at Fort Yellowstone Wyoming, got on a spree, ill-treated his horse, and used vile language to a lady passenger, who remonstrated with him. The Fort Yellowstone court martial brought him to time and after a trial ordered his dishonorable dismissal from the service and confinement at the fort for half a year.

Cook John A. Hardersen, at Fort Harrison, has been detailed to a course in cooking at the Cook School at Fort Riley, Kansas.

Last year 90,155 tons of coal briquettes valued at \$223,657, were produced in this country.

Major Amos B. Shattuck and Major John A. Randolph (chaplain) at Fort

Missoula, have been instructed by the war department to go to Fort Snelling, Minnesota, on the morning of September 29th, to take the famous riding test prescribed by Col. Roosevelt.

Major John H. Beacom, at Fort Hart, has also been ordered to take the test, as well as a large number of officers in North Dakota and Minnesota.

The trade in mineral waters in 1908 did not show the depressed condition of many other industries consequent on the financial disturbance of 1907, according to the geological survey. The total quantity sold during the year was 56,168,829 gallons, compared with 52,060,529 gallons in 1907. The value of the output decreased slightly, from \$7,331,593 in 1907 to \$7,287,269 in 1908. This showing is a little surprising in view of the fact that some of the widely sold carbonated table waters are to most consumers luxuries rather than necessities. The totals reported do not represent the real importance of this industry in the United States, for the reason that at many resorts the quantity of water furnished free to guests far exceeds the quantity sold, and no figures are available to show the quantity or value of strictly artificial table and medicinal water or of sweetened beverages ("soft drinks") produced.

The number of springs reporting sales in 1908 was 695, including one or more in every state and territory. Although this was an increase of 111 over 1907, the gain in production was not due wholly to this cause and that many springs sold more water in 1908 than in the preceding year. The average retail price of the waters at the springs was 13 cents a gallon. The leading states in quantity sold were Minnesota, New York, Wisconsin, Massachusetts, Ohio, Virginia, Michigan and California.

The condition of the mineral-water industry during 1908 shows that the demand for pure drinking water extends across the continent and has come to stay. The growth of population, the movement toward cities, the wholesale pollution of surface waters and the time that must elapse before even a major part of the cities are provided with purification plants are factors that indicate continued growth for the table-water trade.

The imports of natural, semi-artificial and strictly artificial waters for consumption in 1908 were 2,912,398 gallons, valued at \$1,323,047. No figures are available to show the exports, though considerable quantities of certain domestic waters are known to be

exported to Canada, Mexico, and the West Indies.

Supervising Engineer I. W. McConnell, whose district embraces the North Platte irrigation project, Nebraska-Wyoming, has been in Washington a few days on business connected with his territory. He states that the interstate canal, which is now 55 miles long, this year carried almost its maximum capacity. The flow was 1,150 second feet, and furnished an ample irrigation supply to 20,000 acres on the Carey segregation in Wyoming, and about 75,000 acres in Nebraska.

The operation of the canal for the first time under such a large head has required an unceasing vigilance and fairly heavy expenditures, but the work has been carried on without interruption of any consequence, and the farmers have had an ample supply of water throughout the season. The crops are good. In view of the fact that this is the second year of operation the amount of land under cultivation is regarded as large. It is anticipated that in the season of 1910, with certain extensions that are planned for the winter and spring, the interstate canal will irrigate upwards of 110,000 acres of land, of which probably 75 per cent are in cultivation.

In the upper districts the improvements in the farms are very marked. The settlers are building good houses and barns and are setting out trees, drilling wells and in other ways adding to the attractiveness of their homes. The Pathfinder reservoir held a maximum of over 700,000 acre-feet of water this season. The North Platte river discharged probably the greatest run-off of its history during 1908, the run-off during the month of June having been greater than the average yearly run-off. In June the contractors finished the Pathfinder dam, which is 215 feet high, and is one of the finest examples of masonry in the west.

During the coming season the Pathfinder dike, which is required to close a low gap at the south end of the dam, will be built so that for the irrigation season of 1910 and thereafter the Pathfinder reservoir will have a capacity of over 1,000,000 acre-feet, which makes it one of the largest artificial lakes in the world. The cost per acre-foot of stored water will be very low and will make it one of the most attractive reservoirs in existence from the standpoint of cost. The capacity of the reservoir is large enough to guarantee a reliable water supply for all the irrigable lands in the North Platte valley under the reservoir which can be reached by gravity canals.

He also reports that about 25,000 acres of land under the Belle Fourche project in South Dakota were irrigated this year. The storage reservoir has not yet reached a stage where it can be utilized. The Belle Fourche dam which will be the largest earthen dam

in existence, is about 60 per cent completed, and at the end of the present year the gap in the embankment at Owl creek will probably be closed.

Next year stored water will doubtless be available for all the lands which are at present under canals. Under the Outlet canal there are 12,000 acres at the present time; under the South canal, about 16,000 acres, and under the Indian creek lateral of the North canal there will be 16,000 acres. The rights in the project were not an direct diversion from the Belle Fourche river, and the supply was sufficient.

The Northwestern railroad has secured a right of way for a line to extend from Belle Fourche to Pierre, which will give transportation for all points in the project with no haul exceeding 10 miles. The company promises to complete this road within a year.

Crops are good over the entire project he says. There has been excessive rainfall for this section during the year, and less irrigation was needed than in ordinary years. Prices are holding up well and the farmers are looking forward to a prosperous harvest.

That President Roosevelt was right in his stand that the power of the secret service should be strengthened instead of hampered, is evidenced by numerous reports to the departments here. A particular instance is that of Brigadier General Myer, commanding the department of Texas, to the war department. He reports that the unlawful disposition of uniform clothing by enlisted men of the army continues, as well as of forage in tracking; down raising forage he says that two privates were employed to act as detectives to discover the facts. General Myer strongly recommends that the employment of the government secret service officers be authorized in these cases in the army.

A plan is on foot to bring together in Washington in the summer of 1911 a combined convention of all the patriotic and veteran organizations of the country.

President Taft and his party will not go down the broad expanse of the Mississippi river from St. Louis to New Orleans next month in a foreign boat under a foreign flag. Such a suggestion, naturally repulsive to Americans, met with a flat refusal from government officials here having in charge his transportation on the trip. Nameless hints would be current that the president would be compelled to travel under other than the stars and stripes on the Mississippi, but there is not a grain of truth in them.

The department of commerce and labor, which controls navigation on the inland waterways of the country, has charge of the president's accommodations on the trip of inspection of the

mighty Mississippi. Several days ago it received a suggestion from the committee at New Orleans which will entertain the president, that the government engage one of the luxuriously accommodated steamers of the United Fruit company which plies between the gulf ports and South American countries. The president's party will number about 14, including his secretary, cabinet officers and a few personally invited guests, and one boat will be sufficient for them. The committee hinted that there was not an American boat available in the vicinity and that the fine steamers of the foreign lines touching at the gulf ports would be the proper thing to house him. Assistant Secretary of the Department McHarg withheld his consent to such a proposal, being reluctant to believe that at the principal gulf port American shipping had so dwindled that the president could be compelled to cruise on the greatest American river under a foreign flag. The department is anxious to have an Amer-

ican boat convey the party, and is holding open arrangements in the hope that one may be secured. Information received to date indicates, however, that there is no commercial boat on the Mississippi available and the government will detail one of its light-house tenders for the president's party. The tender Oleander, at Key West, Fla., was first decided on, but doubt was expressed by the reception committee that she would accommodate the party. The tender Lily has also been suggested, but her speed is four knots lower than that of the Oleander and she will not be employed. It is thought very probable that the Oleander will be finally selected, and if she will not accommodate the party it will be divided, and the second section of the party will be accommodated on the tender Hibiscus, although the latter has quite a heavy draft for the Mississippi.

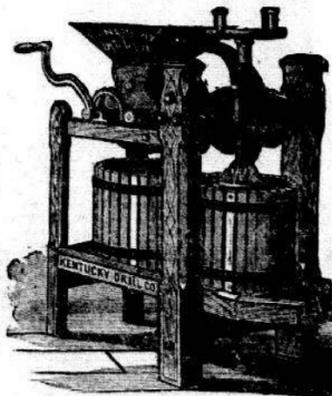
One thing is certain, the president will not go down the Mississippi on a foreign boat. Although the arrangements may be changed before the trip, it is now pretty certain that the tender Oleander will convey President Taft and his party on the inspection of the Mississippi.

An order continuing after October 15 the postoffice at Ripley, Lincoln county, has been issued by the postmaster general.

A WOMAN'S APPEAL.

To all knowing sufferers of rheumatism, whether muscular or of the joints, sciatica, lumbago, backache, pain in the kidneys or neuritic pains, to write to her for a home treatment which has repeatedly cured all of those tortures. She feels it her duty to send it to all sufferers free. You cure yourself at home as thousands will testify—no change of climate being necessary. This simple discovery banishes uric acid from the blood, loosens the stiffened joints, purifies the blood and brightens the eyes, giving elasticity and tone to the whole system. If the above interests you, for proof address Mr. M. Summers, Box 8, South Bend, Ind.

Buckeye Cider Mills & Presses



Latest Improved Adjustable Throat and Grinding Rollers. Guaranteed to do as good work and to have as large capacity as any hand-power mill made. Attractive in appearance. Three sizes: Senior, Medium, Junior. Easily worked.

Buckeye Cider Mills are all made with strong iron bearings. The throat is adjustable, adapting it perfectly to all kinds and sizes of fruit. The grinding rollers are adjustable. This mill also has a most perfect grinding apparatus, having serrated ribs on one roller working against the straight ribs on the other, thus giving a shearing cut and grinding finer than any other mill. The strainer board under the tub allows the cider to pass freely from the pulp.

- Junior Buckeye Mill, weight 165 lbs; price \$16.00
 - Medium Buckeye Mill, weight 225 lbs; price \$22.50
 - Senior Buckeye Mill, weight 345 lbs; price \$30.00
- To adapt Senior Mill to use with belt power \$1.50

NELSON-CANNON COMPANY

Phone 221

Corner Cedar and Stevens Streets