

UNITED STATES NAVY YARD.

To show the extent and importance of the mechanical operations at the national navy yards, let our readers read this short account concerning the yard at Washington:—

The morning bell rings in over six hundred mechanics, together with a large corps of laborers, swelling the number of employes up to nearly a thousand, independent of those connected with the shipping, and a full regiment of troops, all of whom are actively employed.

SHIP HOUSES AND SHIP BUILDING.

Every branch of naval art, from the building of the hull of a steamship of war of the largest class, to the smaller articles required in her finish, are prepared in the navy yard. Here some of the largest and finest ships in our navy were built. Among the latest is the *Minnesota*, 3,500 tons, now in the Gulf. In another ship house on the opposite side of the yard, the *Potomac* was constructed. The river is navigable for ships drawing eighteen feet of water up to the navy yard.

MARINE RAILWAY.

In the repair or examination of the bottoms of war ships, the marine railway offers every facility. The steamer *Mount Vernon*, a few days since, was discovered to be in a leaky condition; she was immediately brought to the marine railway, and by the force of an immense hydraulic engine she was drawn from the water and repaired in short meter, and is again in the fleet.

ENGINE AND BOILER SHOPS.

These important branches are conducted in the large center building, which measures 432 by 265 feet in size, two stories high, and contains six large steam engines, required in vitalizing the operations in this great naval workshop. Engines and boilers, of any capacity required in the navy, are constructed. Those for the large war sloop *Pensacola*, together with all of her machinery, have just been completed here, and put up in that vessel, now nearly ready for service.

THE ANCHOR SHOP.

Here a forcible illustration is presented of the power of mind over matter. The building is 265 feet long, with forges requiring two tons of coal to a single fire, and trip hammers weighing five tons, every impact of which produces a concussion felt over a large portion of the yard. Here the waste or scrap iron from the United States navy yards is brought together and converted into blooms, and these into navy anchors, varying in size from the convenient kedge to the best bower of the largest ships afloat.

CHAIN SHOP.

In this department there are seventy-eight fires and one hundred and twenty men. Cables, embracing the entire range in size, are here manufactured, and their strength thoroughly tested, before they leave the shop. These, with the usual ship work, give employment to a large corps of workmen.

ROLLING MILL.

Large quantities of copper, brass and composition metals are employed in the construction of war ships. The heavy rolling mills are propelled by a double engine of 150-horse power, with a 19-ton balance wheel making 60 revolutions per minute. Copper from the Cliff Mines of Lake Superior is used, after passing through the refining process is formed into round or square bars, or rolled out into sheets for ships' bottoms, or for cutting into nails, or forming into percussion caps, and is reduced, when required, to the thinness of the sheet of paper in the reader's hands. Lead from Western mines is also rolled into sheets for all the purposes required in the navy.

NAIL WORKS.

Copper and iron cut nails of every size, from the small tack to the largest nail required, are manufactured in the yard. The machinery is of the most approved kind, and very efficient.

BLOCK MAKING.

Blocks for new ships and for supplying the wear and tear of those already in the service, are manufactured. The machinery is propelled by steam power.

STEAM SAW MILL.

There is a very efficient saw mill with upright saws in the yard, for cutting heavy timber. For lighter work, circular saws are employed.

PLUMBERS' DEPARTMENT.

A large amount of plumbing is required in the navy yard, and the works in this department are in active

operation. A steam engine is employed to drive the various machinery.

CABOOSE AND WATER TANK MANUFACTORY.

Quite an interesting department, and presenting scenes of busy activity. Ships' galleys, with apartments for soup, meats, baking, &c., for a ship's roll of one to five hundred men, are being manufactured, together with all the articles required in the culinary department.

BRASS FOUNDRY AND FINISHING ROOMS.

The brass foundry, brass finishing rooms, and copper refinery are contiguous to each other. Here brass and composition castings are made, finished and prepared for use. In the refinery, copper is subjected to intense heat in ovens, purified and cast into cakes about 12 by 14 inches square and 1½ inch thick, in which condition they are removed to the rolling mills, and there reduced to sheets.

RIGGING AND SAIL LOFTS.

These are large, light and airy. At present they are partially used as quarters for the regiment assigned for the navy yard.

THE ORDNANCE DEPARTMENT.

The machinery in this department is pressed to its utmost capacity. In a building over 200 feet long, every available foot of space is occupied with machinery, and every piece of machinery is in motion. In the ordnance foundry (which is entirely distinct from the brass foundry, in another part of the yard), brass cannon and howitzers of all the various sizes are cast in large numbers. These are then passed into the main ordnance building, when they are turned, bored, finished, and mounted on carriages. The Dahlgren improvement, in the composition and mechanical construction, has been adopted in all the guns used in the navy, and experience accords to the Dahlgren guns greater endurance, range, and accuracy than any other artillery of equal weight now constructed, either here or in Europe.

MINIE AND MUSKET BALLS.

The Minié ball is made with great rapidity, on an ingenious machine invented by a lieutenant in the army. The lead is supplied to the machine in round bars, and the balls are turned out at the rate of 16,000 in ten hours, or 266 per minute. Musket balls (used also for canister shot for cannon) are manufactured even with greater rapidity. The machinery is kept in constant operation.

SHOT, SHELL, AND CANISTER.

Shot of all sizes, and shell from four up to eleven inches, are rolled out hot from the molds in rapid succession. They are cast with great precision, and afterward put through a process which gives them a perfect spherical form. Canister shot are made from both cast-iron and lead. They are packed in canisters, made to fit the bore of the cannon, and each canister, when filled, is soldered up. The weight of the canister thus filled, is made to correspond with that of the ball prepared for the same size of cannon.

SHELL AND AMMUNITION BOX FACTORY.

In this, as in all other departments, the works are driven by a steam engine, and great activity prevails. Every shell, when completed and charged, is inclosed in a box for protection, from which it is not removed until required for use. These cases and ammunition boxes of the various sizes required, are now being manufactured in large quantities. In this department all kinds of cabinet and joiner's work for the navy are prepared; offices, bureaus, desks, &c., are manufactured. A large number of hands are employed.

OUTSIDE MOVEMENTS.

The wharves are covered with shot, cannon, little mountains of coal, naval stores, &c., while war and transport steamers lie closely together in the docks.

OBEY THE LAWS.—Motley, in his recent able argument in behalf of the Constitution and the Union, states that the Supreme Court of the United States, after the government had been established, held this language in an important case—"Gibbons against Ogden":—

"It has been said that the States were sovereign, were completely independent, and were connected with each other by league. This is true. But when these allied sovereignties converted their league into a government, when they converted their Congress of ambassadors into a legislature, empowered to enact laws, the whole character in which the States appear underwent a change."

There was never a disposition in any quarter in the early days of our constitutional history to deny this great fundamental principle of the Republic.

An Immense Fortification in Progress on Sandy Hook.

Some two years since, it will be remembered that a great topic of discussion in military and civil circles was the defences of New York harbor. There was a prevalent opinion among the most distinguished engineers that, in order to complete the protection of the bay and city, and prevent a descent of hostile forces on the shores of New Jersey, it was absolutely necessary to guard the outer key of the Atlantic, by erecting a huge fort on the most favorable portion of Sandy Hook. Defences thus located, it was believed, would command the ocean access to the empire city, and strengthen the upper forts for a renewed attack in case an enemy should pass beyond reach of their batteries.

Acting on this suggestion, the Federal government ordered the building of an immense fort on the western portion of the beach, which, from its extent and solidity, will no doubt be considered one of the most formidable harbor defences of the United States. The corner stone of the fort was laid on the 26th of March, 1859. The walls will cover an oblong area of about one mile in length. It will have five bastions, the length of each of which will be in accordance with the extent of its particular command of some point of the Atlantic. At present the northeastern bastion is nearly ready for mounting guns, and the eastern and northern curtains which protect it are sufficiently elevated to lay the embrasure stones. Two are nearly ready for the guns. The stones in front of the fort are from six to eight tons weight, and were brought from quarries in Quincy, Mass., and Maine. The tiers of guns will have strong and spacious casemates. The foundation, which is laid in concrete, was made seven feet from the surface, and the breadth of the walls at the base is 14 feet, and on the top 10 feet. The casemates are indented about 36 feet from the outer walls, commanding all points of the surrounding ocean. The fort will be protected by deep trenches at its outer points.

Steamboat for African Travel.

Messrs. Todd & McGregor, of Glasgow, have lately launched a screw steam yacht of 110 tons burthen, built for Dr. Livingstone, the African traveler, intended for the navigation of the river Shire and the great Lake Nyassa, above the Falls. She is called the *Lady Nyassa*; is to have a pair of direct-acting high pressure engines; and when ready for sea will only draw 3½ feet of water. This steamboat is to be taken to the river Zambesi in pieces; therefore she has been built to be put together with screw bolts instead of rivets. She will be first tried on the river Clyde before being taken to pieces for shipment. It is only a few years since this great lake in Africa was discovered by white men; now it is about to become a scene for mercantile operations and steamboat enterprise. Such are some of the rapid changes which modern science and art effect.

American River Steamboats in Ireland.

We take the following extract from the *Dublin News*:—

The introduction of American-modelled steamers of great speed and light draft of water in our rivers and bays is a great improvement on the old dark and ill-ventilated boats, that from the very smell caused sea sickness. We would hope to see the American system on and over deck fully carried out. That we are gradually losing our prejudices and adopting useful innovations can be seen from the Citizens' Company of Cork, whose boat ran from Glasgow to Queenstown, with 30 tons of coals on deck, drawing 3½ feet of water, in 27 hours, or at the average rate of 16 miles an hour. Since her arrival in the Lee, she has made the trip from Cork to Queenstown and back, with several calls and 600 passengers, in 1 hour and 47 minutes; a local paper adding:—"The stiffness of the *Citizen* was tested during the day in a remarkable manner, her top-load was something enormous, but the immense weight did not affect her in the least, she preserved a perfect level without the slightest leaning to one side or other." So much for flat floors and fine wooden ends, instead of the sharp bottoms, with a great rise, of our builders, thinking that sails, not steam, were the power. In Newcastle-on-Tyne several are plying as well as on the Southampton and Isle of Wight station. These boats have their decks extended to the width of the paddle-boxes, on beams supported by sponsons. Thus, a steamer of 16 feet width will have the main deck from 25 to 30 feet, giving from 50 to 80 per cent more room, and if she would have a hurricane deck, from 200 to 300 per cent without extra fuel or labor. Their draft of water is but 2½ feet, with a speed of 16 miles.

GUN COTTON FOR SHELLS.—Gun cotton burns so suddenly that it is apt to burst cannon, if used in them in place of gunpowder. But it has been suggested to us that this same property peculiarly fits this substance for the charging of bomb shells. We do not see why the idea is not a good one.