

The Daily Astorian.

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THE GOVERNMENT JETTY.

The Grand Work of Improving The Mouth of the Columbia.

FORT STEVENS AND TRAMWAY.

The immense work now being done by the government under the direction of the engineering branch of the war department, which has already cost nearly a million dollars, and will cost as much more, for the improvement of the Columbia river, is a matter of importance and interest to all, and well worthy careful consideration.

Progress of the work has been noted in these columns from time to time for several years, or ever since operations were commenced, but as more than a passing notice is required, and in order that those who have not visited the work may form some idea of its extent and importance, a representative of THE ASTORIAN accepted a kind invitation from the officer in charge, and spent several hours there yesterday.

Leaving Astoria at 11 o'clock on the government steamer George H. Mendel, it proceeded up the river to Scow bay where two large barges were taken in tow, each carrying 500 tons of rock. The seven miles were made in an hour and a quarter, and the dock at Fort Stevens was reached, where a lively scene was witnessed.

Two large derricks are on the end of the substantial wharf, each having a double-cylinder mummy hoisting engine, with boiler, for hoisting rock from the barges to the cars, which run to the end of the wharf. A heavy platform was lowered down to the deck of one of the barges which was far down as it was a very low tide. Stepping on the platform one party of six were elevated high in air by the huge derrick, and swung over and down to the wharf as easily as a man would lift a cane.

A NOVEL RAILWAY. J. W. Stoneman, overseer of the work, was there directing operations, extended a cordial welcome, and showed to the office, half a mile away, for a locomotive which was soon at hand. Stepping in the cab, away we go, at the rate of twenty miles an hour, the length of the wharf, along the coast, and then on the trestle of the jetty, heading straight out for the broad rolling surface of the Pacific ocean.

It is a novel sensation as the little engine bows merrily along for water is on either side and all around. It appears like sailing over the ocean in a locomotive, as if the rails were suspended in mid-air, while the wind blows strong and the rolling waves seem striving to reach up and engulf the puny mortals who dare to invade old Neptune's dominions in such a manner. Three and a quarter miles are traversed, and there, out in the ocean, at the end of the tramway, is a huge pile-driver, with engine, pump and all the heavy apparatus mounted on a car which occupies both tracks. The whole thing revolves on a circular track on top of the double car, and its ingenious work was illustrated.

HOW PILES ARE DRIVEN. Stepping on board, the motions are observed with interest. A pile 60 feet long, and a foot in diameter is picked up by the hoisting apparatus, and, like a huge monster with a stick in his teeth, the entire thing revolves, the pile is brought to a perpendicular position, we are standing far out over the rolling, dashing waves, beyond the trestle and down goes the pile in search of Melville.

The mode of driving piles is by hydraulic process. Attached to the sides are two pipes, and at the top of these, hose is connected and through this a strong pump hanging over the ocean, drives water with great force. This washes the sand and mud away from the bottom of the pile, literally digging a hole for it, and on the top a driver, weighing 5,000 pounds acts as a powerful hammer to induce the pile to penetrate that hole as fast as it is dug by the water rushing through the pipes.

Thus it is pushed down twenty feet in the sand and mud, the pipes are drawn up, and a few blows by the heavy driver sends the pile two feet further down. The sinking of the pile occupies but three minutes, but the preparations occupy considerable more time. About thirty piles per day are thus driven. As fast as four are placed, a header is fastened across, timbers are laid on lengthwise, rails are fastened, and sixteen feet more is added to the length of the jetty. Then the operation is repeated.

On returning from the end of the westernmost railroad in the United

States, a halt is made to observe a train of ten cars of rock being loaded. The potent car is tipped and down goes a huge rock weighing several tons, never to come up until Gabriel's trumpet is blown, and perhaps not then.

As it strikes the surface of the ocean, the water splashes up more than thirty feet, coming over the top of the engine, making an exciting picture.

REACHING THE OFFICE, many interesting figures are obtained, and are well worthy of attention. The rolling stock consists of 4 locomotives, 52 cars for carrying and dumping rock, 6 flat cars, and 4 cars for carrying mattresses. Thirty of the rock cars are of a new and improved pattern, costing \$450 each, and were built at the works. A new pile driver was also seen in course of construction, which will cost \$14,000, and three flat cars are being made. There is a complete machine shop and buildings where cars can be manufactured, and where all the necessary repairs are done, thus saving the expense and delay of sending abroad. About 120 men are now employed, and work will be pushed rapidly during the summer.

The rock is brought from the contractor's quarry on the Columbia river at Fisher's landing, Washington, 15 miles above the mouth of the Willamette, or 108 miles from Astoria. It is granite, or rather a strong basaltic lava, quarried in pieces weighing from fifty pounds to nine tons each, costing there sixty-four cents per ton, which is the contract price. The expense of towing to Astoria, thence to Fort Stevens, discharging on the wharf and dumping into the jetty is thirty-six cents per ton, making total cost of rock until it is dropped in the water, one dollar per ton.

STEAMERS AND BARGES. The steamer George H. Mendel was built expressly to order by J. F. Stephens, Portland, Oregon, and the machinery by Neale & Levy, Philadelphia, Pa. The total length is 90 1/2 feet, with 18 feet beam, and draught 7 feet. The engines are inverted compound of receiver type, with cranks at right angles. The propeller is 5 feet, 9 inches, in diameter. The boiler is of the Scotch type, steel, 9 1/2 feet diameter by 10 feet long, and has two furnaces. The boat throughout is first-class in every respect, was launched May 19, 1889, and cost \$20,000. The wireless compass and little engine were originally on the steamer City of Yakima, which was wrecked at Yakima bay. The boat is named after Col. George H. Mendel, of the U.

S. engineers, and is commanded by Capt. John W. Brown. There are ten barges used, six of which carry 300 tons each, and four are of 500 tons capacity, and cost \$5,870 each. The size is 120 feet in length, beam 32 feet, depth 8 feet. The government steamer Cascade, Capt. Whitcomb, tows the rock laden barges from Fisher's landing to Astoria, and the Mendel takes them down to the wharf at Fort Stevens.

FILES, BENTS AND MATS. Thus far there have been driven over 5,000 piles, which are twelve inches in diameter and from 55 to 70 feet in length. These are in foms, with a space of five feet between the two outer piles on each side, and eight feet between the two inner piles, making eighteen feet across the four, and on these, strong headers are bolted across. These bents are 16 feet apart, and on them are laid timbers on which is built a double track railway, three-foot-gauge, with 13 feet between the centers of the tracks, and the rails are about 24 feet above the level of low tide.

Outside the piles, on the north side, are placed mattresses or mats, commonly called—20 feet square and three feet thick. These are made of stout poles and brush, securely fastened and brought out on the tram way on mat cars, made expressly for the purpose, from which they are dumped into the water, and rock is dropped upon them. Between the piles and bents mats are made 64 feet long, 20 feet wide, and five feet thick, of poles and brush, like the others, except that they must be constructed at the spot, the poles being suspended from the timbers until the mat is completed, when it is lowered to its place beneath the water and rock is dumped upon it. No mats or rock are south of the pier or trestle, but under it and on the up-river side, thus forming a rock jetty forty feet in width.

The object in constructing the jetty is to contract the mighty flow of the Columbia river, so that the depth of water on the bar at low tide shall be thirty feet. The action of the water in going out in a narrower channel than before the jetty was commenced has shown the utility of the latter, for there is now 27 feet of water on the bar at low tide, and has two feet more. The completion of the work will evidently accomplish the desired result, and when it is considered that the commerce of a great country—an empire in extent—will be benefited, and that the Columbia is the second largest and most important river in the United States, the cost is of trifling importance. The work will

be a benefit to the nation, or to the entire world, for very much of foreign commerce passes this point.

FORT STEVENS. Fort Stevens is a regularly constructed fort, surrounded by a moat, crossed by a single bridge at the entrance, where heavily ironed plank doors are placed. No troops have been there since 1885, and it is in charge of Ordnance Sergeant McCabe, of the 2nd U. S. Artillery. The armament consists of thirty-four guns, twenty-four of which are mounted on barbette carriages. There are twenty-nine Rodman guns, three of which are eight-inch, twenty-five are ten-inch, and one of fifteen-inch bore. The only rifled gun is a five-ten-inch Parrotts, which throw a ball weighing 250 pounds. The solid shot for the ten-inch Rodmans weigh 125 pounds each, while the huge fifteen-inch gun throws a ball weighing 150 pounds. In the powder house or magazine are over 2,000 pounds of powder, while piles of shot and shell for both smooth bores and rifles are abundant.

The officers quarters, barracks for soldiers, mess rooms, guard house and other buildings form quite a village, which is occupied so far as needed by Mr. Hegardt and the men in the employ of the engineering department, for they all sleep there and are subsisted by the government. The grade ground is large, and the entire location is remarkably pleasant. The grass is growing finely and an air of neatness and comfort is apparent. An abundant supply of water is provided by a large windmill and two tanks of liberal size.

COMMENCEMENT AND PROGRESS OF WORK. The work of constructing the jetty was commenced April 11, 1885, and the present length is 17,400 feet, or a little over 3 1/2 miles. There is yet to be built about 1 1/2 miles, for the total length intended will be five miles. The amount of the appropriations for expenditures was \$787,500, and a special appropriation of \$75,000 was made this spring, which is being used for the present work, in addition to a balance of \$173,247.08 on hand last July from the former appropriation, and unexpended.

From April to December, 1889, or during eight months, the following articles were used in the jetty: 104,200 tons of rock, 7,925 cords of fascines, 13,690 poles for mats, 141,800 linear feet of piles, 753 tons of coal, 430 cords of wood and 1,127,000 feet of lumber. The present daily consumption is 750 tons of rock, 18 piles and 50 cords of brush for mats. Since last July the jetty has been extended 7,800 feet. The average cost of construction of

the tramway is \$4.65 per running foot. Ten new cars have been built this last winter, as well as extension of track, switches and turnouts, to facilitate operations. If necessary, 1,200 tons of rock could be handled daily, taken from barges and dumped into the jetty. The trestle work and tramway is extended some distance beyond where the mattresses and rock have been placed, but these are daily being extended. At extreme low-water mark one can walk out on the sand nearly half the length of the jetty, and the rocks can be seen some distance further.

The fascines cost \$2.74 per cord, and are of fir, cedar, hemlock, or willow. The poles cost 24 cents each, delivered. The piles are brought from Vancouver. For general convenience, the wharf, office, residence and barracks, and the end of the jetty are connected by telephone. A government telegraph line connects Fort Canby, Fort Stevens and Astoria. One is also constructed down the coast some twenty miles to Tillamook, and a cable is soon to be put in connecting with the light house station on Tillamook rock. A system of electric bells is in use connecting wharf, office and residence, so that an alarm in case of fire can be given instantly by the watchmen at those places.

The local officer in charge, is G. B. Hegardt, assistant engineer, who makes weekly and monthly reports to Major Thomas H. Handbury at Portland, who is major, corps of engineers, U. S. army, and in charge of all the government improvements in Oregon and Washington.

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