

that has already reached large proportion and is increasing at a rapid rate. Such is a brief history of the Columbia and the beginning of its commercial importance.

Artistically the entrance to the Columbia offers many attractions. From whatever point of view that may be selected, looking either out or in, a picture is presented most captivating to the artist's eye. From the hills back of Astoria, from the bluffs of Knappton on the north bank, from Fort Stevens or Point Adams, from Ilwaco on Baker's bay, from Cape Disappointment, and finally from the ocean itself, the bar and its surroundings present a scene most pleasing to the lover of the beautiful. The last point of view is the one selected by Capt. Cleveland Rockwell for his elegant painting, of which we present an engraving, a painting highly valuable for its subject, its faithfulness to nature and its excellent coloring. It represents a large ship going to sea, being towed over the bar by one of those little steam tugs, without whose aid no sailing vessel ever attempts to cross. To the right is Point Adams and to the left Cape Disappointment, while in the background the wooded hills that form the river's banks come together in the distance and apparently form a complete shore line. It was this deceptive appearance of the hills that led the early explorers to doubt the existence of a river, believing it to be simply an inlet guarded by a dangerous line of breakers. To Captain Rockwell we owe much for his faithful representations of the grand scenery of the Columbia and other places on the coast, and for no picture more than for this magnificent painting of the Columbia river bar.

#### TILLAMOOK ROCK LIGHT.

The difficulties overcome and the expense and labor of establishing and maintaining the various stations of the light house system of the United States, are appreciated by few, even of those actively engaged in the work. We give an engraving of Tillamook Rock Light, as seen from the east, a light that in the difficulties and dangers encountered and the expense incurred in its construction is probably equal to any in the whole system. The following facts are gleaned from the report of Maj. G. L. Gillespie, light house engineer of the 13th district. Three appropriations were made by congress, aggregating \$125,000, for the establishment of a light to serve as a warning to vessels off Tillamook head and to aid them in locating the mouth of the Columbia. It was at first proposed to erect the house on the head itself, but owing to its inaccessibility from the sea, the fact that to reach it by land would require the building of a road twenty miles through a broken and unknown region, and the additional fact that the altitude was too great for an effective light, Major Gillespie recommended a change of the location to Tillamook rock, having approached near enough to the rock in June, 1879, to inspect it and satisfy himself that it was a practicable location.

Tillamook rock is a bold, basaltic mass rising abruptly from the sea, one mile off Tillamook head, and twenty south of the entrance to the Columbia. The water on the west, north and east is from 25 to 40 fathoms deep, while on the south it shoals to 16 or 18 fathoms. As it rises from the sea the face of the rock is precipitous on

the west side for about 15 feet, and then slopes gently back, forming a narrow, irregular bench extending along the north, west and part of the south sides. Springing from this bench and inclining towards the sea, it rises on the west to a total height of 120 feet, with a rounded knob on top. The north side is nearly vertical. On the east it is very steep from the crest for 30 feet downwards, and then slopes off gradually to the sea. On the south side a deep fissure divides the rock into two unequal parts, as is plainly shown in the engraving. The fissure runs into the rock from the west, terminating against a rocky wall that rises abruptly before it to the height of 30 feet, the top of which is the bottom of the gap as seen in the picture. Even in a calm sea the swell beats the water into foam about the rock, while in times of storm the billows dash madly against it and leap far up its sides. The water rushes into the fissure with great violence, throwing spray to the very top of the rock, often leaping over the intervening wall and sweeping down the opposite side. It is a grand sight to witness this mighty power shattering itself in passionate desperation against the immovable mass that stops its onward course. Looking eastward from the rock the shore line is marked by three distinct headlands, whose fir-covered tops rise 1,500 feet above the sea, and at whose bases are visible vast heaps of rocks, some in ledges laid bare by the action of the sea, some in immense broken pieces brought down by land slides from the mountain sides, and others standing in detached masses like the great rock itself. It is an inhospitable coast, and can nowhere be approached with safety in a small boat within twenty miles, save during calm weather in the summer time at Clatsop beach. When first visited by the workmen, the rock swarmed with sea lions, which were indisposed to abandon it to the intruders; but eventually they retired to other rocky retreats further to the south.

The first attempt to land upon the rock was made June 22, 1879, under the management of H. S. Wheeler. The revenue cutter *Corwin* steamed to within a short distance of it and launched a surf boat, which was boldly run close to the east side, notwithstanding the fact that the waves were dashing in foam against it. After considerable trouble two men succeeded in scrambling upon the rock, but before the boat could return to them with a line, the waves rose higher and threatened to cut them off entirely from their companions, and they therefore jumped into the sea and were with much difficulty rescued from drowning. Another attempt was made three days later, when Mr. Wheeler succeeded in landing in person and with a tape line measured the most important dimensions. On the eighteenth of the following September John R. Trewavas and a sailor named Cherry succeeded in gaining foothold upon the rock, intending to make a complete survey, but Mr. Trewavas slipped from the wet slope into the sea, and though Cherry jumped in after him and the surf boat went immediately to his rescue, he was drawn down by the undertow and was never seen again. On the twenty-first of October the *Corwin* left Astoria with men, equipments and supplies sufficient to last several months, and made fast to a spar buoy that had been put down a few days before within 300 feet of the rock. Two men succeeded in landing from the surf boat, and

were taken the end of a cable that had previously been fastened to the mast of the vessel. This they wound around a projecting ledge eighty-five feet above the water and drew it taut. On this cable was put a large single block, called the "traveler," with a long hook suspended from it, and this was drawn forward and backward between the vessel and the rock by an endless rope running through blocks at either end. All the materials and supplies were transferred to the rock by being suspended from the hook attached to the traveler and then drawn along by the rope. Three additional men were landed in this way, riding in a novel conveyance called the "breeches buoy." It consisted of an ordinary circular life preserver, slung from the traveler, to which was securely lashed a pair of breeches cut short at the knees, the latter to support the man in the proper position while in the air, and the former to preserve his life if he should chance to fall into the water. It was impossible to keep the cable taut, as the vessel was in constant motion under the action of the heavy swells of the sea, and it was not unusual for the passenger to be dipped under the waves several times during his short journey. In all, nine men were landed and began work under the superintendence of A. Ballantyne. For the first fifteen days after landing, their efforts were directed towards providing shelter for themselves and their supplies. The rock had no deep recesses in which they could take refuge, and shelter from the driving rains could only be had by making small A tents and lashing them down to bolts let into the solid rock. After blasting out a place for the main derrick, they commenced the work of leveling off the top of the rock, and this was by no means an easy undertaking. The crest was too irregular and narrow for parties to work well in concert, and the wind swept round it with such terrific force that it was impossible to remain there during a gale. Working parties were supported upon staging, suspended from bolt attachments let into the solid rock, until they had blasted out a secure foothold for themselves. In the face of dangers and hardships the men worked diligently throughout the winter, and prepared the rock for the reception of the derrick and so progressed with the main work that a larger force could be utilized. Early in January the coast was visited by a terrific storm, which caused the waves, after rebounding from the face of the rock and filling the chasm on the south side, to be thrown by the wind entirely over the rock a every point continuously for many days, carrying away, in their impetuous descent down the opposite slope, the supply house on the lower level and endangering even the quarters of the men above. The storm reached its height during the night of the ninth, when the men were in their bunks. In a panic they were about to rush towards an apparently secure level higher up, but were restrained by Mr. Ballantyne, who well knew that in the intense darkness they could never cross over the slippery rocks, and would be swept off by the wind into the maddened sea below. Fortunately sufficient provisions had been stored in the quarters to last during the two weeks that elapsed before it was possible to reach the rock with fresh supplies. The force was then increased, and by the first of May the top was leveled ready for the buildings, 4,630 cubic yards of solid rock having been removed. An effort to fill the chasm on the south