above Astoria. They own 5,000 acres of timber land and are building two miles of railroad for logging purposes. An extensive mill will soon be erected. On the Nehalem, to the southeast, are many square miles of the choicest timber, which can only be reached by means of a railroad. The line from Forest Grove will run through the valley, and the transportation of logs to Astoria will be one of the largest items in its traffic. There are two sash and door factories, one owned by William Howe, and the other recently built by Hansen & Co., at a cost of $10,000.

Incident to the lumber industry is the question of ship building. During the past season there were built 325 fishing boats, about two-thirds of them by William Howe. These cost $220 each, or a total of $71,500. The number required each year to maintain the supply will in future be from 150 to 200. There is no regular ship yard, yet a number of vessels of various kinds have been built. Within the past year the steamer *Montesano*, the tugboats *General Miles* and *A. B. Field*, and the barge *Astoria No. 1*, were constructed, and in 1881 the fine steamer *Clara Parker*. This vessel was built by H. B. Parker, its owner. She is registered at 257 tons, is 110 feet long, 24 feet beam, and 6 feet depth of hold, E. P. Parker, master. Many smaller craft of various kinds are constantly being built. The facilities for a ship yard are unsurpassed on the coast. Within easy access is the finest quality of timber, the harbor is large and deep, and material of all kinds can be readily and cheaply procured. An experienced ship-builder from Maine, who has been examining the coast, recently stated that Astoria was the best point he had seen for that business. Two machine shops do a general machine work, chiefly for the canneries, mills, and steamers. Arndt & Ferchen employ fifteen men. The Astoria Iron Works employ thirty-five men in their shops and foundry. Here are made the Jensen can-filler, an ingenious machine for canning salmon. With four men to operate it, the machine will fill fifty cans per minute, accomplishing as much as twenty-eight Chinamen working by hand. Fourteen of these are now in successful operation, and orders are received for others. One valuable feature is the regularity. It keeps the men constantly busy and practically regulates the working of the whole establishment. The following certificate has been made by F. C. Reed, manager of the Fishermen's Packing Co:

In addition to what has already been said in favor of the Can-Filling Machine, patented by Mr. Jensen, and built by the Astoria Iron Works, I can say that it is the greatest labor-saving machine that has yet been invented for packing salmon. Last Friday our machine, running at moderate speed, filled 411 cases in ten hours, and Saturday it filled 320 cases in seven hours. I am confident that it will fill 500 cases per day and do it better than can be done by hand.

The inventor has also patented an ingenious machine for knitting fishermen's nets.

La Force's oil factory manufactures an excellent quality of machine oil from the heads and entrails of salmon, procuring material from the canneries. From six to ten barrels are turned out daily.

A tannery in the upper town is owned by C. Leinenweber, and manufactures a superior quality of leather.

One of the industries of the future, as soon as the railroad is built, will be the manufacture of flour. The amount of wheat raised in Clatsop county is small, but when the crop of the Willamette valley commences to travel over the new road to find a shipping point at Astoria, large flouring mills will naturally follow. The facilities for obtaining wheat and shipping flour will be of a superior kind.

SALMON CANNING.

It is upon the canning of the celebrated Columbia river, or Chinook, salmon, that the present prosperity and business of Astoria depends. In 1833 Nathaniel Wyeth, member of a Boston firm, came to the coast for the purpose of packing salmon and dealing in furs, but abandoned the project after two years of unsuccessful effort. About thirty years later Jotham Reed and a partner established a cannery at Oak Point, where they put up salt salmon. In 1867 William, George W. and R. D. Hume and A. S. Hapgood, built a cannery at Eagle Cliff, and packed that season 4,000 cases. The business has increased year by year until in 1881 there were put up 550,000 cases of four dozen one pound or two dozen two pound cans. In 1882 there were packed on the river 543,831 cases of an average value of $5.25, worth in the aggregate $2,855,112.75. There are now on the river thirty-nine canneries, twenty-four of them in Astoria, of which six were built within a year. In the city are the following: Seaside Packing Co.; Washington Packing Co.; Union Pacific Packing Co.; Cutting Packing Co.; Samuel Elmore Co.; Astoria Packing Co.; J. W. Hume; George W. Hume; John A. Devlin & Co.; I. X. L. Co.; Pacific Union Packing Co.; Occident Packing Co.; Columbia Canning Co.; West Coast Packing Co.; A. Booth & Co.; Badollet & Co.; Point Adams Packing Co.; C. Timmins & Co.; Fishermen's Packing Co.; J. O. Hanthorn & Co.; S. D. Adair; Anglo-American Packing Co.; Thomes & Wetherbee; Scandinavian Packing Co. Others on the river, all of them to a large degree tributary to Astoria, are: Aberdeen Packing Co., Ilwaco; John West, Hungry Harbor; Joseph Hume, Knappton; James Williams, Tanzy Point; J. G. Megler, Brookfield; Pillar Rock Packing Co., Pillar Rock; Ocean Canning Co., Bay View; F. M. Warren, Cathlamet; Hapgood & Co., Waterford; Eureka Packing Co., Eureka; William Hume, Eagle Cliff; J. W. & V. Cook, Clifton; James Quinn, Quinn's; A. W. Berry & Co., Rainier. There are now 1,500 boats engaged in fishing besides others laid up, costing on an average, including net, etc., $650, or a total of $975,000. The average cost of canneries and fittings is $15,000 each or in all $585,000. This gives us a grand total of $1,560,000 invested in the factories and equipments alone. This does not represent the capital invested, as the current expenses of conducting the business amount annually to a much larger sum. Boats last from eight to ten years, but the nets are good for one season only. These are about 300 fathoms long and cost $400, the lines and corks being worth at the end of the season about $75. The thread of which they are composed costs $1.10 per pound. These nets are made by the fishermen during the winter time. Attached to every cannery are extensive piers on which are racks for spreading out the nets to dry, and these may be seen on every side. When the fisherman owns his net and rents a boat he receives ninety cents for every fish, but when both are supplied by the cannery the price is but fifty cents. This varies each year according to circumstances. The season is limited by statute from April 1 to July 31. But few fish are taken the first month, the largest run being in June. Though salmon weighing sixty pounds and even more are occasionally caught, the average weight is twenty pounds. The average catch of the largest cannery last season was 1,200 fish per boat. The fishing is generally done at the mouth of the river near the bar, the best time being at the turn of the tide. With the exception of here and there a sail nothing can be seen just before the tide comes in, but soon afterwards the white sails cover the river as the boats come home with the product of their night's fishing. Many lives are annually lost in the breakers of the bar, but the fate of their companions does not deter others from following the dangerous occupation.

As a representative we will take the cannery of M. J. Kinney (Astoria Packing Co.), the largest in the world. The establishment covers an entire block of ground, with a water frontage of 500 feet, all built upon piling. There are also seven piers for net racks, each 60x240 feet. He owns 85 boats and employs 170 fishermen and 126 hands in the cannery. The fishermen are chiefly Swedes, Norwegians, Danes and Italians, while the factory hands are nearly all Chinamen. Last season 35,000 cases were packed, but the estimated product this year is about 25,000 unless the run of fish increases. The process of canning is very interesting and more intricate than one would suppose, beginning with the manufacture of the cans and ending with the packing in cases. For making cans there are several machines in use. The tops and bottoms are cut with great rapidity by dies, and the sides by a knife cutter. The sides are then rolled, six at a time, on a machine somewhat resembling a clothes wringer. They are then taken to the men who solder the seam, and from them to Chinese boys who put on the bottoms with great dexterity and rapidity. A little piece of solder, called a "float," is dropped in the can and a hot iron is run around the inside, melting it and fastening on the bottom. At Kinney's there is also in use a soldering furnace and rimmer for fastening bottoms, similar to the one used for the covers, described later. The cans are now ready for use, after being carefully examined to see that they are perfect, and we now go to the point where the canning work begins.

The boats discharge their loads of salmon on the dock, the fish being piled up near the butcher. A stalwart Chinaman then lays about a dozen on the table in front of him and speedily severs the head, tail and fins from the body, opens the fish and removes the entrails, each act being accomplished by a single dextrous stroke of the knife. The refuse falls through a chute into a receptacle, from which it goes to the oil factory. This man can thus dispose of from 1,500 to 2,000 per day. The fish is then dropped into a tank of water, from which it is taken by another man who removes the scales and further cleans the salmon. It then goes into another tank, through the hands of a second cleaner and into a third tank of water. They are taken from there to the gang slicer, a machine that with one stroke cuts a whole fish into lengths just the height of a can. The chunks are then taken to a number of choppers who slice them lengthwise into several smaller pieces, when they are carried on trays to the fillers. These press the pieces into the cans, filling them as compactly as possible. A Chinaman will fill