

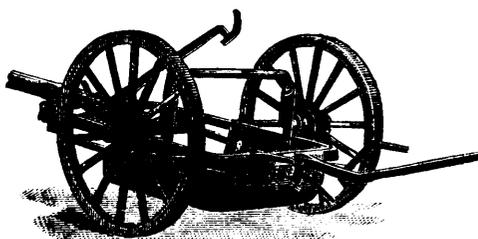
Each gallery conveyor has a capacity of 15,000 bush. an hour, making the total carrying capacity of the wharf conveyors 900,000 bush. a day. About 100 ft. of the connecting gallery between the two elevators is built of steel, with fireproof bulkheads, thus making it impossible for a fire to be communicated from one house to the other through the galleries.

Turning our attention now to the elevators themselves, we find an unloading and handling equipment fully in keeping with the shipping facilities described. Ten pairs of power shovels in elevator 2 and seven pairs in elevator 3 give an unloading capacity of 200 cars a day. The elevating capacity of the 24 legs is almost 2,000,000 bush. in 10 hours. The elevator legs in elevator 3 are equipped with 7x7x20-in. buckets on 22-in. belt, and in elevator 2 with 7x7x18-in. buckets on 20-in. belt. There are ten 1,200 bush. and fourteen 1,400-bush. hopper scales, having an aggregate weighing capacity of 31,600 bush. or 1,896,000 lbs.

Each elevator has the usual reversing belt conveyor in the cupola for distributing grain longitudinally of the house, while in elevator 3 these belts are loaded by special loading spouts hung on revolving shafts to be swung out of the way of the trippers. The trippers are of a new design with ring-oiling dust-proof bearings, and are probably the most efficient machines now in use for this work. Seventy-six distributing spouts discharge grain from the scales into 370 bins, each 13 ft. square, of which elevator 2 has 148, each 61 ft. deep, and elevator 3, 222, 70 ft. deep. Ample facilities for loading into freight cars by means of bifurcated spouts are also provided. Elevator 2 is equipped for five cross-house basement conveyors and elevator 3 for seven. A very complete system of dust collectors and floor sweeps discharges the dust from the two elevators into the boiler furnaces. Each house has a first-class passenger elevator running from the first floor to the cupola.

The power plant for elevator 2 includes two 24x42 horizontal Atlas Corliss engines of 700 h.p. combined capacity, and four 150 h.p. vertical tubular boilers. In the power house of elevator 3 are two 24x48 girder-type condensing Corliss engines of 1,000 h.p., running independently, and four 250 h.p. vertical tubular boilers. Electric current for lighting is taken from the Portland City Electric Co.'s wires. Both stacks are of steel, lined with brick. One is 175 ft. high and has a 6½ ft. flue; the other is 156 ft. high, with a 5½ ft. flue. Power transmission throughout the whole system is by rope drives. An idea of the extent of the drives may be had from the fact that 14½ miles of rope were used in these transmissions.

Special attention is called to the foundations. About 6,000 piles were used in the entire system. Above these on grillage caps are concrete piers, and in elevator 3 the retaining walls are also of concrete, reinforced with steel rods. By the use of these rods the thickness of the wall could be very materially reduced, so that there was a large saving in the amount of concrete necessary. All of the concrete for piers under elevator 3 was prepared with a concrete mixer designed especially for mixing the concrete for these foundations. Handwork is used only for unloading the cars of unmixed materials, after which all handling is done by a series of belt conveyors, elevators and derricks. The materials fed in are sprouted out as thoroughly mixed concrete, ready to be swung away in great buckets by a boom derrick swinging the full width of the building, and to be dumped into the wooden forms for the piers. The mixer is mounted on cars, together with the engine which runs it, and can be hauled along the track beside the elevator excavations as the work progresses. All of the concrete for elevator 3 and its power-house, amounting



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