SEATTLE

LEVEL LUFFING CRANES FOR THE DEEP SEA PORT OF ANCHORAGE

By
EUGENE L. SCHMIDT

Anchorage, Alaska, one of our fastest growing international commerce deep sea ports, is the largest City of our Forty-ninth State. It is situated on the eastern shore of the Knik Arm of Cook Inlet, a 100-mile long harbor on the southern coast of Alaska, where tides of 36 to 40 feet present challenging transportation and engineering problems for the City and its able Port Director, Henry Roloff.

In keeping with Alaska's potential and future growth, the City of Anchorage has constructed a large deep water dock to handle cargo quickly and efficiently. Four gantry cranes, the level-luffing type, were purchased by the City for their new port facilities. This modernization followed the completion of a feasibility study by the consulting firm of Coverdale & Colpitts. The firm of Tippetts-Abbett-McCarthy-Stratton designed the terminal around the specific recommendations of the feasibility study of Coverdale & Colpitts; and, after calling for competitive bids, placed the order for the cranes with the Washington Iron Works of Seattle, Washington, which was completely responsible for their designed manufacture and erection at Anchorage.

The Seattle Branch of Pittsburgh Testing Laboratory was selected by the Engineers and Mr. Roloff to act as their inspection and testing agency.

Level-luffing cranes are quite common in Europe, but they are not so well known in this country. They are pimarily designed for loading and unloading ships, and are usually limited to rather light loads, approximately five or six tons. The name level-luffing comes from the fact that the load travels along a level line when the boom section is luffed (raised or lowered). Raising or lowering the boom of the usual type crane results in the load being raised or lowered with it, causing waste of considerable horsepower which slows down the operation. The standard crane, to clear the ship's rigging, must also rotate and travel at the same time. The level-luffing crane, however, can clear the rigging by luffing and rotating, which is an advantage when two or more cranes are working the same ship.

View of Boom After Assembly.

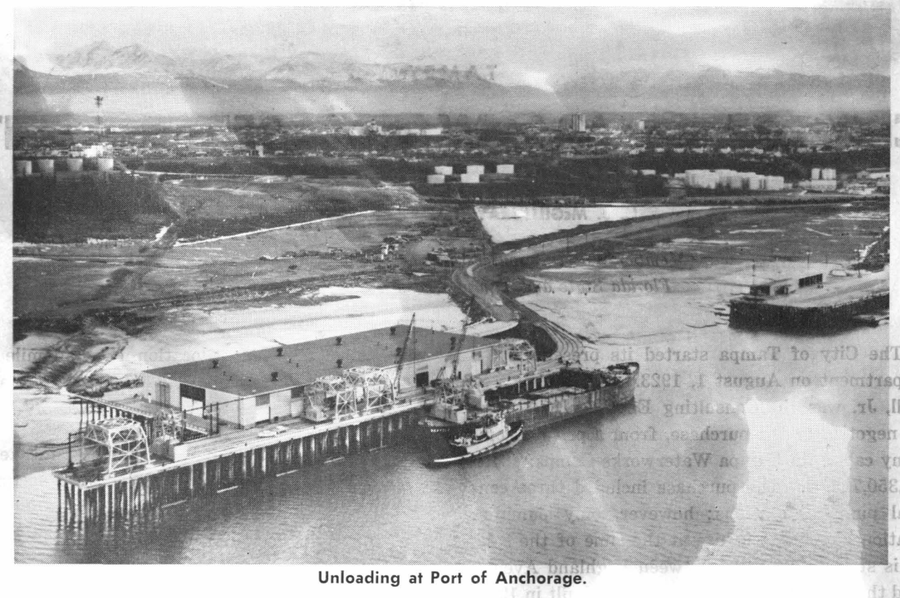
Gantry Testing at Seattle Wharf.

Level-luffing may be accomplished in any one of a number of ways. The method used on these cranes for obtaining the level-luffing effect is a counter-weighted boom hinged-jib system. It was chosen for its faster smoother action and longer rope wear. The level-luffing is accomplished, in this system, by mounting a hinged-jib on the end of the boom and controlling its action, by means of fixed cables anchored on the superstructure of the crane and attached to a curved cam-like section at the rear of the jib. In operation, the centerline of the jib is nearly level when at the extreme radius. It is held in this position by the fixed cables, the boom being at approximately forty-five degrees. As the boom is raised (the hook radius being decreased), the rear end of the jib is raised with it, and the jib tip tends to drop. However, the cam-like section of the jib is designed so that enough slack of the fixed cables is wound upon it; and, although the rear of the jib raises and the tip tends to drop, the tip actually moves along a level line. This system will provide perfect level luffing only for the hook operating from the jib tip. Therefore, on the forty-ton crane, which has two hooks separated by several feet, it was necessary to supplement the level luffing action of the 40-ton hook by means of an ingenious reeving arrangement. This arrangement, while it uses the hoist line to provide the level-luffing, has no effect upon the hoisting of the load.

The cranes built are of two sizes. One pair has a maximum capacity of 40 tons each, and the other has a maximum capacity of 7½ tons each.

SPECIFICATIONS FOR COMPONENT PARTS

	Crane and Gantry 40-Ton		Crane and Gantry 7½ Ton	
Unit Weight	208 tons		108 tons	
Main Hoist Line HP	100 HP		100 HP	
Auxiliary Hoist Line HP (5 ton)	75 HP		0 HP	
Swing	40 HP		20 HP	
Level Luffing	30 HP		10 HP	
Travel	4 (10 HP)	40 HP	4 (5 HP)	20 HP
Main Hoist Line	1″ W/6 part			
Auxiliary	⅞″ single		1⅛″ single	



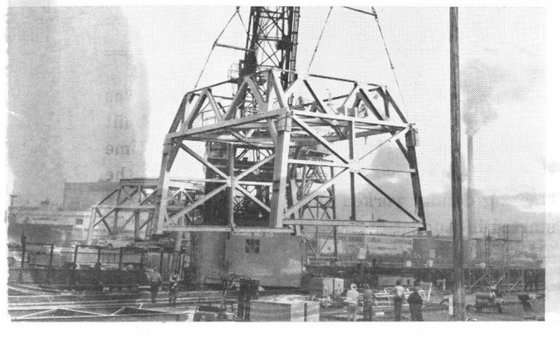
Unloading at Port of Anchorage.

The larger crane has a main hook having the following capacities: 40 tons at a 30 feet radius, 30 tons at 75 feet and 25 tons at 84 feet. The auxiliary hook has a five-ton capacity at a 34 to 94 feet radius. The hoisting speeds are 35 FPM for the main hook and 200 FPM for the auxiliary hook. The smaller crane has a single hook with a capacity of 7½ tons at a 29 feet to 74 feet radius and 5 tons to an 89 feet radius. The hook speed is 200 FPM.

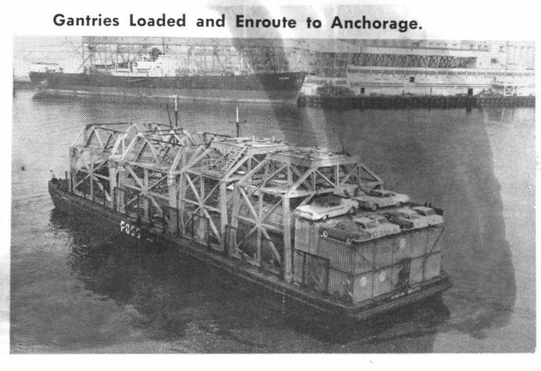
In addition, automatic rail clamps were installed, and they are controlled by an anemoneter. This mechanism is controlled so as to energize the rail clamps when the wind velocity exceeds 40 MPH. In this manner, the cranes have been safeguarded against possible drifting during the high velocity winds.

While our Forty-ninth State is just one year old, she can point with pride to her modernization program, second to none in our fifty states. With a coastline of some 80,000 miles, much of her future domestic and international commerce will be handled through similar deep water ports. All America salutes the courage, vitality and far-sighted leadership of this "go-get-um" Alaska City.

Loading Cranes Aboard Barge at Seattle.



Gantries Loaded and Enroute to Anchorage.



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