

shipping to boats and receiving from boats are continuous operations, automatic scales are used for this work, but as it is necessary in receiving from cars to keep each car weight separate, hopper scales are employed for car receipts.

Drying.—A Hess drying plant with a capacity of 5,000 bushels per day is included in the equipment. This has a separate leg so that interference with the main receiving and shipping legs is avoided.

Power.—All power is supplied by electric motors of the induction type. In the elevator, marine tower and the new shipping galleries the motors number 80, and total 4,680 horse-power.

An ingenious and efficient system of electric signals controls the operation of elevator legs and shipping conveyers. When the extent of the shipping system is remembered, and the interconnection of the two elevators, it will be seen that the signal system, particularly for shipping, must be instantaneous and sure; its design was accomplished with credit.

The harbor commissioners' grain storage and shipping system will now consist of: Two grain elevators with two marine legs each, and a conveyer system by which grain can be delivered from either elevator to any of 19 steamer berths. Everything is of fire-proof construction and all machinery is electrically driven. There is a storage capacity of 3,620,000 bushels and contemplated extensions for 3,790,000 bushels more; total, 7,410,000. Grain may be received from cars at a rate of 33,000 bushels per hour and at the same time from boats at a rate of 55,000 bushels per hour.

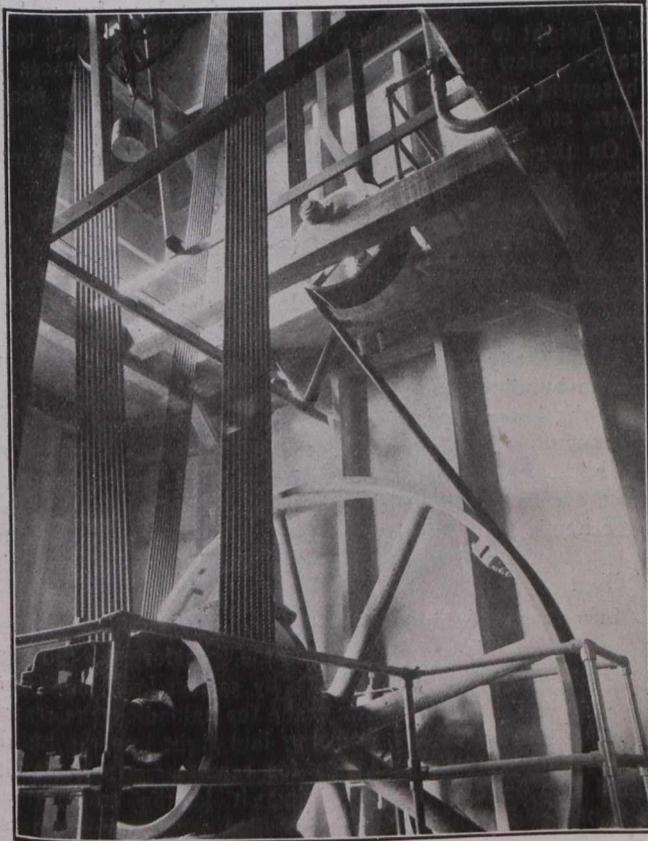


Fig. 8.—Drive to Receiving Elevator Leg.

Grain can be shipped by conveyer system to ocean steamers at their regular berths at a rate of 150,000 bushels per hour, equal to 4,500 tons per hour. It is possible to deliver grain to five steamers at the same time at a rate of 30,000 bushels per hour each, or it is possible to deliver to 10 steamers 15,000 bushels per hour each at the same time.

The present conveyer system comprises two miles of conveyer galleries and over eight miles of rubber belting. In addition to this there is under construction another half mile of gallery with two miles of rubber belting.

The constructing engineers for the Montreal harbor commissioners were the John S. Metcalf Company, Limited, Montreal, under Mr. F. W. Cowie, chief engineer. This company were also the designers of the conveyer system in connection with elevator No. 1.

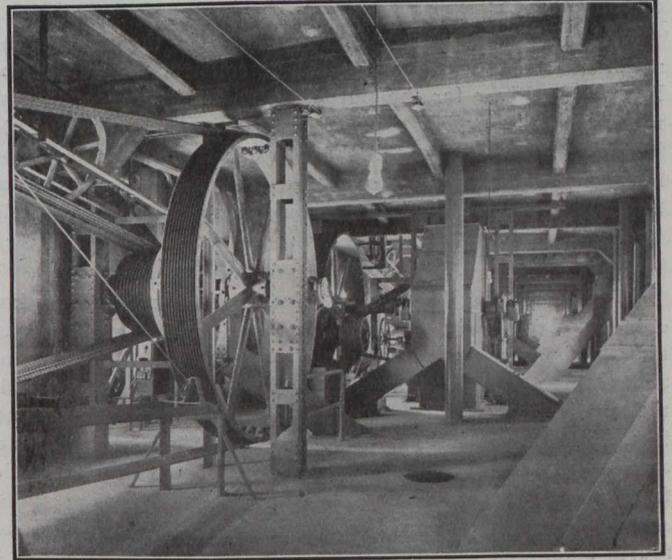


Fig. 9.—View of Top Floor Showing Elevator Heads and Drive.

It is easy to say that this building or that building is the best ever built, and that this elevator or that elevator can handle more grain than any other; the harbor commissioners responsible for the new work, Messrs. Stephens, Ballantyne and Geoffrion, with Mr. David Seath, secretary, are content to let the elevator and accessories speak for themselves.

PHYSICAL PROPERTIES OF CONCRETE.

The National Bureau of Standards of the United States in its general investigation of structural materials is engaged, among other things, in the determination of the physical properties of concrete. At the suggestion of engineers and others, the Bureau of Standards is investigating the cause of cracking in concrete structures, where the necessity for expansion and contraction joints is questioned. For this purpose, reference marks were placed on some of the typical old and new concrete work in Wayne County, Michigan, also at Greenwich, Connecticut. Measurements will be taken from time to time during the summer and winter to determine the expansion or contraction in the concrete caused by temperature variations and the changes of volume which take place during the hardening of the concrete. Similar reference marks are being placed on the lock walls of the Panama Canal and various other structures, from which valuable information will be obtained.

Steel on the Tofield-Calgary branch of the Grand Trunk Pacific has been laid as far south from the main line as Irricana, and that the grade is now ready for entry into the latter place. A bridge at the Bow River, about four miles out of Calgary, is likely to delay track laying a little. This bridge is of steel construction and is to be erected by the Canadian Bridge Company.