

many ores formerly considered useless. A calcium carbide works will be another feature.

The project for the establishment of the power canal at the Sault was proceeded with so quietly that the work was well under way before the general public learned much of anything regarding the scheme. It is now expected that the canal on the U.S. side will be in operation late in the present year, & those persons most thoroughly conversant believe that the Consolidated Lake Superior Co. will not be much behind its rival at Niagara Falls in the development of 100,000 horsepower.

During the early part of the present year the Lake Carriers' Association, comprising in its membership all the principal U.S. vessel owners on the great lakes, became aroused lest the power canal project would affect the level of Lake Superior & the ship canal, & thus work serious injury to navigation interests on the inland seas. Representatives of the vesselmen's association declared before a committee of the U.S. House of Representatives that if the power canal lowered the level of the government ship canal around the rapids at the Sault so much as one inch, it would entail a loss of \$1,250,000 to the vessel & iron ore interests every year. Engineering experts have disagreed regarding the influence which the power canal will exert. Just what action will be taken is problematical, but that some legislative limitations will be exacted ultimately seems highly probable. Meanwhile, the excavation of the canal goes actively forward, & upward of 1,500 men are engaged in the work.—Waldon Fawcett.

THE CONNERS SYNDICATE.

Montreal, Duluth & Minneapolis Elevator Systems.

Towards the end of April the Syndicate submitted to the Montreal Harbor Commissioners plans for a 1,000,000 bush. grain elevator to be erected in Montreal, upon which the Harbor Engineer reported as follows:—"The plans indicate that the elevator is to be erected on the lower portion of the Windmill Point pier, between the Windmill Point basin & the canal basin, & that it is to be of a capacity of 1,000,000 bush. The site is according to the stipulations of the contract between the Commissioners & W. J. Connors & associates, but the capacity of elevator required by the contract is 3,000,000 bush., instead of 1,000,000, as shown by the plans. It is explained in conversation by G. T. Smith, on behalf of Mr. Connors & associates, that a detached storehouse of 2,000,000 bush. capacity is to be afterwards erected between the canal lock & the Windmill Point basin, & that the two buildings will be so arranged & so connected by conveyors as to act as one elevator with a total storage capacity of 3,000,000 bush. It is, however, to be noted that Mr. Smith's letter does not mention the proposed storage house nor do the plans show any provision for future connections between the two buildings.

"The following are the chief characteristics of the elevator shown upon the plans:

"The building is to be 274½ x 90½ ft. at the ground line, & 121½ ft. in height, from the level of the edge of the Windmill Point basin wharf to the top of the main building, & 191 ft. to the top of the cupola. It is to be placed at 24 ft. clear distance from the face of the canal & wharf, & about 79 ft. from the face of the harbor wharf, Windmill Point basin, & so as to extend 260½ ft., or the length of a canal boat, along the upper part of the canal basin. Its upper end will, therefore, be 12 ft. beyond the head of the basin. The car tracks which are on the first floor will be at a level 120.25 above harbor datum, or 13¼ ft. above the edge of the harbor wharf, which makes them above winter water level, & therefore acces-

sible by cars all winter, provided the tracks on the wharf to the southwest of the elevator be raised to the same height, as has been recently proposed. The marine legs for receiving from canal boats & the conveyors for delivering to vessels in the harbor are not shown on the plans, but the connecting spouts are indicated. The receiving & delivering speeds are not marked on the plans, but the sizes & arrangements of the elevating legs, conveyors, etc., indicate that the rate of handling will be very fast. The elevator will have 101 bins of about 9,500 bush., & 24 of about 3,200 bush. capacity each, making an aggregate of fully 1,000,000 bush."

The Commissioners decided that the plans submitted could not be entertained, on account of showing only one-third of the capacity agreed on. The Syndicate was notified accordingly & made a reply from which the following are extracts:—

"Supplementing the detailed information given to the Harbor Engineer, relative to the plans already submitted, we beg to say that the policy of procuring large storage capacity for grain by the construction of storage tanks, operated in connection with what is known among transportation people as a 'working house,' is so well established elsewhere that it was adopted here as a matter of course. Moreover, site 'A' being the only property covered in the allotment that was ready to receive improvements, it became rather a complicated engineering problem in what manner the buildings could be so distributed as to meet the immediate necessities of the port, & at the same time give economy & despatch in the operation of the plant. The accompanying ground plan, showing how, as it seemed to us, this could be accomplished best, contemplates:

"1. A 'working house' of 1,000,000 bush. capacity, plans for which are now in the possession of the Commissioners. This building would have a capacity for weighing & storing grain, at a rate not less than 25,000 bush. an hour, & probably much in excess of that amount; & of discharging at the rate of 1,000 bush. a minute. If worked to its capacity, during the season of navigation, it would handle twice the present business of the port.

"2. A 'storage house' of 2,000,000 bush. capacity, connected by conveyor belts with the 'working house.' Grain for this building would pass in & out through the 'working house,' the mechanical equipment of which is designed for 3,000,000 bush. capacity.

"3. Freight warehouses, covering all of the property not occupied by the other structures.

"This scheme of construction gives 272 ft. of warehouse room upon the canal basin, 1,170 ft. upon Windmill Point basin, & 260 ft. at the northerly end of the pier; & by the use of carriers & conveyor galleries along the roof of the warehouses, it would be possible to receive 3 canal & 2 ocean vessels at a time, & to unload grain & package freight upon the canal side, & discharge grain & package freight upon the ocean side simultaneously. It enables us also to utilize for the 'storage house' a portion of the property along the lower deck, which could not otherwise be used to advantage. The interior construction would be such that cars could be loaded & unloaded independently of the operations outside.

"The terms of sect. 9 of the agreement give the Commissioners such complete authority, not only over all plans, but over the specifications of all structures, that we saw no impropriety in sending those for the 'working house' in advance of the others, for the simple purpose of facilitating the work & making more rapid progress. We do not believe it will be held by the Commissioners that since the capacity agreed upon is supplied, it must necessarily be under cover of one roof. A 'working house' of 3,000,000 bush. capacity

would occupy all the space along the canal basin, & extend so far upon the ocean side of the pier as to seriously cripple the usefulness of the freight warehouses. The first cost would be large, & the amount of power necessary to operate it & the proportionate increase of operating expenses in other directions would make it a perpetual burden upon the business of the port. Its capacity would be so far in excess of the limitations of Windmill Point pier that it would, in this respect also, represent a useless waste of energy. The plans submitted are the best that engineering skill, united with experience, can produce; & we say that if the elevator is built here, following those plans, there will be no better structure anywhere in the world."

Engineer Kennedy gave his opinion that the arrangement proposed would be satisfactory, & that the building would cost over \$1,000,000. In a subsequent report he said—"The space allotted to the Syndicate has a canal frontage along the whole length of basin no. 1, of 544 ft., & on its opposite side it has a harbour frontage on the Windmill Point basin of 1,170 ft. The canal frontage is just long enough to berth 2 canal boats of the full length, which the enlarged locks will admit, & the harbor frontage is enough for 3 ships, of 390 ft. average length, or for 2 ships of much greater length. It is proposed to occupy one-half the canal frontage, that is one boat's length, by the 1,000,000 bush. elevator, of which plans were formerly sent in, & the other half by a 1 story warehouse. Beyond the warehouse, & clear of the canal basin, there is to be a grain storage house of 2,000,000 bush. capacity. In other words, the elevator, instead of being a single building, is to be divided in 2, & a package warehouse placed between them, & the whole to be so located that one-half of the canal basin will face one part of the elevator, & the other half will face the warehouse. The part of the elevator fronting on the canal basin will be the working house, & will contain all the motors & machinery & storage room for 1,000,000 bush.; the other part will be merely a storage house, with capacity for 2,000,000 bush., but no machinery, except belt & conveyors for connecting it with the working house & carrying grain backward & forward between the two.

"On the harbor front there is to be a large 2-story warehouse, 1,072 ft. in length, & of widths varying from 35½ ft. at the upper end to 249 ft. at the lower. Between & through the two ranges of buildings there are to be railways & roadways. The Connors' contract provides that there shall be erected on the Windmill Point site 'a 1st-class modern steel or combination elevator of 3,000,000 bush. capacity, & 1st-class modern warehouse, so that the full space will be required & actually used in their operation.' I am requested to say whether, in my opinion, the elevator & warehouses shown on the plans, & described in the letters thus far received from the Connors Syndicate, conform to the requirements of the contract. The plans received do not, in themselves, conform to the requirements of the contract, inasmuch as they are not complete, & are not accompanied by specifications. They show the structural features, & arrangements of machinery of the 1,000,000 bush. elevator buildings more fully, but show only the outlines & locations of the warehouses. Only the main features of the scheme of the buildings, & the proposal to provide the requisite elevator capacity by two buildings, instead of one, can, therefore, be dealt with at present. As regards the general scheme of the buildings, I am of opinion that in their location, dimensions & general arrangement, they do conform to the conditions of the contract. As regards the elevator, the contract uses the word 'elevator' in the singular, but that does not, in my view, require that it shall consist of a single building. What is proposed by the