## MOUNTAIN INCLINE AT HAMILTON, ONT.

THE Hamilton Mountain Park Company, Limited, of Hamilton, Canada, recently installed a new electric hoist, with interesting and novel features, to operate their incline railway which gives access to the large tract of land they have acquired at the top of the mountain and to the fertile country beyond. The "Mountain," as it is called, is really the Niagara escarpment, the steep bluffs behind Hamilton being a prolongation of the heights at Queenston, over which the Niagara River originally flowed, before cutting back the gorge to the present falls. The difference in elevation between the general level of the city and the plateau back of the bluffs is 325 feet, and as the roads leading up the bluffs are few and necessarily steep, the incline in question does a large The time required for making a single trip is  $1\frac{1}{2}$  minutes, and the rest period between trips 3 minutes. Attached to each car are two ropes of  $1\frac{5}{8}$ -in. diam., each rope weighing 4.15 lbs. per ft. One of these ropes is used for hauling the car, and the other for the purpose of safety. The average rope speed during the run is  $5\frac{85}{12}$  ft. per minute.

Incline Arrangement.—The hoist is located in a house 106 ft. from the knuckle between the incline and the level of the summit. The main rope from the right-hand car is wound over the top of the right-hand hoist drum. The main rope from the left-hand car is wound underneath the left-hand hoist drum. The safety rope from the righthand car is led over suitable deflecting sheaves to the top of the left-hand drum, and that from the left-hand car is wound over suitable deflecting sheaves to the bottom of



Fig. 1.-View of Incline Railway in Operation.

business in transporting passengers, automobiles, teams, etc. The original steam hoist used for this purpose became inadequate to handle safely and quickly the rapidly increasing traffic, resulting in the installation of a modern system well equipped with numerous automatic safety devices. The contract for the complete equipment was taken by the Canadian General Electric Co., Limited.

Electric Hoist.—A special double fixed-drum, doublegeared electric incline hoist, built by the Lidgerwood Mfg. Co., New York, represented by Canadian Allis-Chalmers, Limited, operates two cars in balance on an incline 800 ft. long with a grade of 40.27%. Each car weighs 30,000 lbs. and runs on tracks having a gauge of 12 ft. 1½ in., the centre to centre of tracks being 20 ft. 3 in. The average load on the cars will be about 20,000 lbs., with a maximum load of 30,000 lbs., and the hoist arrangement is suitable for either hoisting the maximum load with empty car descending, or for lowering the maximum load with the empty car ascending.

the right-hand drum. Each of these sheaves is 7 ft. in diam. to the bottom of the rope groove and weighs 3,500 lbs. There are 4 head sheaves and 4 deflecting sheaves. The former are arranged vertically so as to carry the hoist ropes and safety ropes in a direct line from the cars; the deflecting sheaves are placed horizontally at such an angle that the rope will be led in a direct line to either the top or bottom of the hoist drums, as, the case may be. Floating sheaves are also furnished to guide the ropes and are placed in the rope tunnels between the head sheaves and the hoist drums. The reason for reeving the safety ropes as outlined above is that in case of an accident to the lefthand side of the hoist the safety rope on the left-hand car would take care of it properly, being wound on the right hand drum; the same thing would apply if the other drum of the hoist should become disabled; that is, the main ropes and the safety ropes from each car lead to opposite drums. Further advantage is gained by the fact that each drum is equipped with an independent double-acting brake, and in case either of the main ropes should break, the