A ROLLING ROAD FOR HORSES AND WAGONS.

BY ARTHUR B. WEEKS.

A novelty in the way of transportation has been recently put in service at Cleveland. In that city most of the freight houses, coal yards, lumber yards, and many manufacturing plants are located in the flats along the Cuyahoga River, while the city at large is on a level 65 feet higher. A vast amount of teaming is done from the flats, wagons following a roundabout course up the various hills, and carrying much lighter loads than the same horses could easily pull on the level.

It requires thirty minutes to an hour to make the climb, the strain on horses and wear and tear on vehicles and equipment being excessive. A rolling road was designed by Col. Isaac D. Smead, of Cincinnati, to obviate this. It is probably the first of its kind in the world, and was built at a cost, exclusive of preliminary models and designs, in the neighborhood of $100,000.

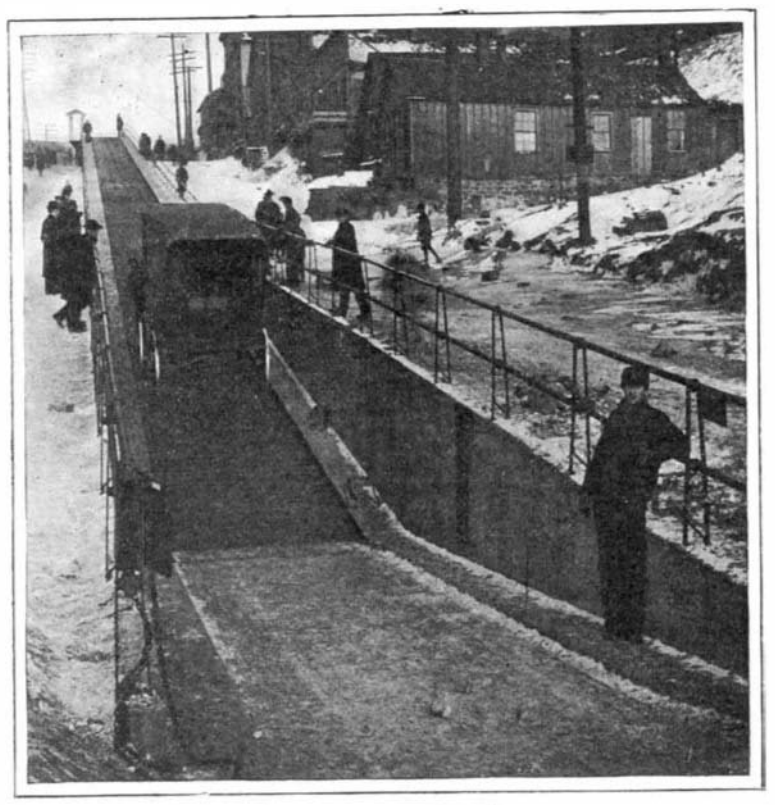
The rolling road is located on the shortest and most direct line from the flats, with a rise of 65 feet in 420 feet. It consists of an endless belt and platform made of planks eight feet long placed transversely of the roadway and bound with angle irons. They are securely fastened together in trucks of two planks each, adjoining trucks being connected by heavy links to form the continuous roadway.

The roadway runs on some four thousand small wheels in which, to reduce friction and wear, a special type of Hyatt roller bearing was successfully introduced. At the upper end the roadway revolves around an immense sheave, the returning belt running underneath (and wrong side up) on idlers to a similar sheave at the lower end.

Loaded wagons drive on the roadway at the foot of the hill, the wheels being securely clamped to prevent backward sliding. After a signal has been given to the operator in the controller house at the top, the road is started, horses and wagon remaining stationary on it till the top is reached. At the summit the roadway again slows down, and the wagons drive off.

The unconcern with which horses make the trip is surprising. They are seldom alarmed even for the first time, and after two or three rides take it quite as a matter of course. The rolling road attains a maximum speed of three miles per hour, and is driven by four electric motors placed at regular intervals along its length, operated by a single controller. As the belt is endless and can be stopped at any point (and as frequently as desired) several wagons can be handled at once; indeed, it is somewhat in the nature of a "continuous performance," one driving on at the bottom at the same time one goes off at the top, others standing meanwhile at various points along the road. As many as six wagons have been on the road at one time, and single loads weighing 18,000 pounds (including weight of wagon and horses) have been handled simultaneously with others almost as heavy.

The average time for a wagon from bottom to top, including stops made for others to get on and off, is from three to four minutes.



THE ROLLING ROADWAY IN OPERATION.

DIAGRAM SHOWING CONSTRUCTION OF THE ROLLING ROADWAY.

CURIOUS EFFECTS OF DAMAGE BY ICE.

The illustrations exhibit clearly the effect of cold winter weather during last February, and its attendant ice conditions combined with the successive rising and falling of tides in raising, by degrees, the piles supporting buildings and bridges located by fishing clubs in Jamaica Bay in New York city.

The extreme cold weather freezes the salt water around the pile between the ebb and flood tides, sufficiently to clench the pile as if it was in a vise. Then as the tide rises two or three feet, the ice coating raises the pile out of the mud bottom. As the tide falls, the weight of the surrounding ice causes the ice in contact with the pile to break off. Another cold spell freezes the water around the pile, repeating with the recurrence of the tide the same operation.

It will be noticed that it is only where the supported weight is light that the piles have been pushed up, such as the small bridge and the front piazza of one of the buildings.

All of the piles under the main buildings, where the heaviest weight is, remain intact. This is due to the fact that the weight is sufficient to overbalance the clinging force of the ice on the surface of the pile.

Long-Distance Electric Railroad.

A project is on foot for building a line of electric railroad in Switzerland and North Italy which will be the longest in Europe, having nearly 100 miles length. It is designed to give a better communication between the cities in the northern part of Italy, especially Turin, and Switzerland. The line will run through a mountainous region and will have very heavy grades. It starts from Martigny in the Rhone Valley and crosses the great St. Bernard by the Col de Ferret. The line will be completed by a section running from Turin to Savona, which is one of the leading Italian ports. The road will be standard gage, with 100-pound rails, and double track throughout. It will give a direct transfer from the other railroads at the connecting points of Martigny and Turin, and will thus afford a through connection between Central Europe and the port of Savona. Current will be supplied by hydraulic power from the Doire and the Drause rivers. Electric trains will be greatly appreciated as there will be 25 miles of tunnel on the line. The profile consists of a series of up and down grades following the valleys and mountains of this region. Electric locomotives will probably be used, as they can take a heavy train in proportion to their weight. Thus the Valtelline locomotives draw a load of 300 tons, while a motor car weighing 60 tons only takes a load of 100 tons. It is not probable that the snow will hinder the operation of the road. As to the current, it is found that 6,000 volts can be used on the Valtelline road. A locomotive of 2,000 horse-power may be employed on the new line. With polyphase motors, a recuperation of 40 per cent can be obtained on the down grade by coupling the motors as dynamos. There will likely be two trains going up grade and two descending at the same time. The hydraulic station will need to give 15,000 horse-power, using 3 units of 6,000 horse-power each. The four trains running at the same time (counting the recuperation of energy) will probably take 6,000 horse-power only. On account of the heavy grades, the trains will not exceed a speed of 25 miles an hour over 20 miles of the road, but this will be made up in the other parts, giving an average speed of 30 miles an hour.

Too Much of a Good Thing.

An old writer says: "When men lived in houses of reed, they had constitutions of oak; when they lived in houses of oak, they had constitutions of reeds." This is a very fine, picturesque description of the injury which may come to us from fine houses too closely sealed to keep out the fresh air, and too heavily curtained, preventing the entrance of sunshine, which is almost or quite as important as air. But it is not at all necessary to have our fine houses unhealthful, and it only requires intelligence and thoughtfulness to render a house of oak as promotent of health as a cabin. Fresh air will come into a well ventilated oaken house as well as through the open cracks in a house of reeds, and sunlight through a window in a palace as well as in a hovel.—Health.

The heating properties of a special coal, says the Engineering and Mining Journal, depend mainly upon the carbon content, the oxygen being usually of no value, because it is combined with hydrogen as water. In gas coals, however, the excess of hydrogen is a material factor in heat production.

Photograph by E. Muller.

THE UPLIFTING OF BUILDING FOUNDATIONS BY ICE IN JAMAICA BAY, NEW YORK.