

rivers and plains, frequently making twenty and thirty miles a day with a load of one hundred and twenty pounds on their backs, and after many days' journey return with equal loads of the produce of other countries and climes.

Sailing down the Pacific coast of Guatemala, the country presents one of the most beautiful sights imaginable. A line of volcanic peaks runs almost parallel with the coast from the frontier of Mexico to that of Salvador. The tablelands rise above the verdure-covered shore, and above these the mountain peaks, many of them capped with snow, and so perfect in form as to give the appearance of having been molded by some gigantic hand. There are some thirty of these peaks classified as volcanoes, and the terrible geological revolutions which have originated from them in times past can only be guessed by the present appearance of the country about them. In some places we find the conglomerations of enormous rocks as though thrown down by violent eruptions, in other places depressions of land where the mountains form colossal walls shutting in the drainage and forming

average foreigner, who is unaccustomed to the seismic disturbances, feels the slightest tremor, and often he stands in the greatest place of danger, wondering what the excitement is all about. My first earthquake occurring during the night, I slept soundly through it all, while other people were tumbling from their beds, falling over tables in the darkness and bruising their shins, in their efforts to get outdoors. The next morning they told me all about the frightful earthquake.

AN EXPERIMENTAL MONO-RAIL LINE.

BY DAY ALLEN WILLEY.

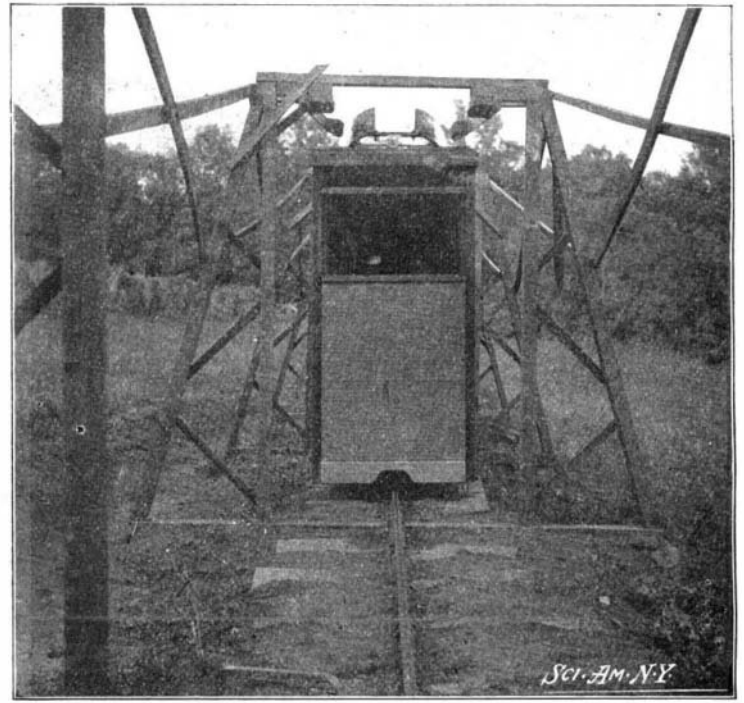
A railway in which the mono-rail system is utilized has been in operation for experimental purposes in the western suburbs of Baltimore for the last few months. It was constructed according to the design of Mr. Howard H. Tunis, who has secured patents on several features of the system which have never before been placed in operation. The track, although but 1,800 feet in length, has the general form of an ellipse, having a grade at several points of two per cent, as

this and the rear wheel only, the rims being grooved to the same depth as the wheels used on ordinary steam standard-gage railway cars. The arrangement of the engine is similar to that of some types employed in automobiles. Although it generates but four horse power, the empty car has been moved around the railroad in $2\frac{1}{4}$ minutes, or at the rate of 9 miles an hour, while with every seat occupied a rate of 8 miles an hour has been maintained without difficulty. In fact, the engine is so small that it seems almost like a toy. About $\frac{1}{2}$ horse power is utilized in running the water and air pumps, so that actually only $3\frac{1}{2}$ horse power is applied to the movement of the load. The car itself with the engine weighs 3 tons, and when filled with adult passengers weighs between 4 and 5 tons.

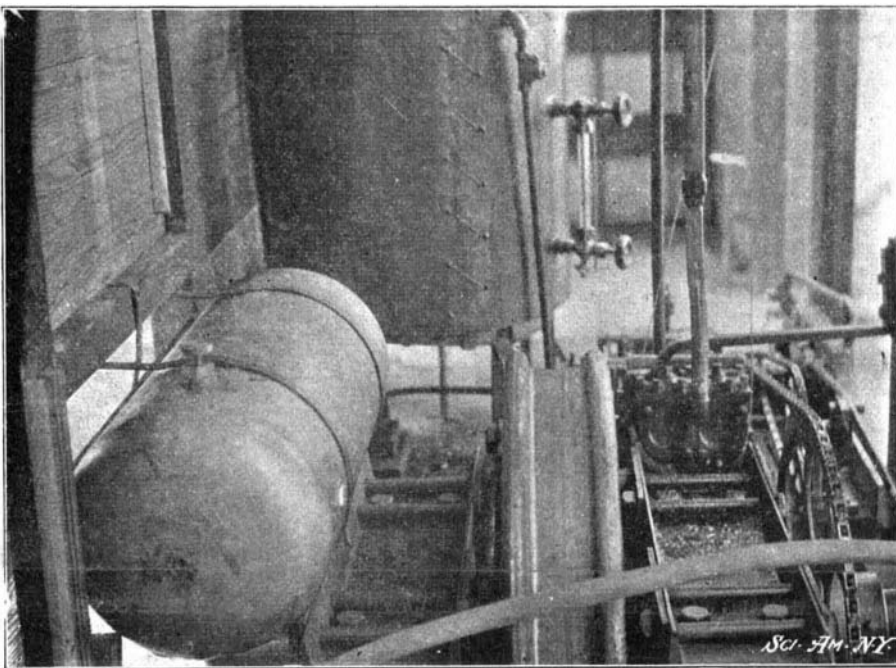
The device which keeps the car from toppling over when in motion is one of the features upon which the inventor has secured a patent. It consists of two strips of wood extending lengthwise along the roof of the car and a series of spring blocks on the archway framework. The strips are slightly



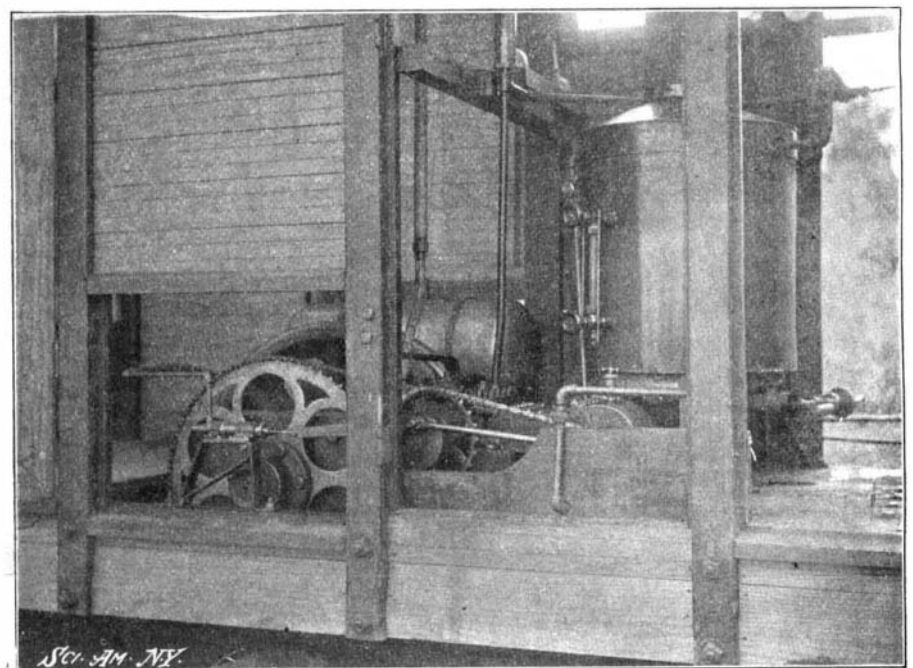
A NEW MONO-RAIL LINE—CAR VIEWED FROM THE FRONT.



REAR VIEW, SHOWING GUIDING STRIP AND SPRING BLOCKS.



VIEW OF ENGINE AND BOILER FROM THE REAR.



SIDE VIEW OF ENGINE, SHOWING CONNECTION WITH TRUCK WHEEL.

great lakes, and in many places great cracks in the earth where it has been rent asunder and never healed.

But the people toil on, building their cities upon the shelving cliffs, planting their wheat and potatoes upon the very slopes of the most threatening volcano, and when the earth rumbles and shakes, the Indian merely looks up from his hoe, shrugs his shoulder, and if nothing more serious happens, he goes on with his work. An earthquake is nothing to him. If it swallows him up, perhaps then, so much the better. He does not seem to have any particular attachment for life. He is a sad, serious personage, who seldom laughs and never sings. He is entirely resigned to his fate, and seems to care little what that fate is to be.

But with that class of people known as the Ladino, the descendants of the old Spanish settlers, it is entirely different. At the very first mutterings of the earth, which seem to precede the usual earthquake, they are seeking places of safety in the open, and they usually begin to pray with all the vehemence there is in their souls. What is more, they fairly anticipate the earthquake, and are fleeing for their lives before the

well as a number of 28-degree curves. The rail, which is laid in the center of the roadbed spiked to ordinary ties, weighs 30 pounds to the yard, and forms practically the only support to the two cars which are operated over the line, as the framework through which they pass is merely intended to maintain their equilibrium. The framework shown in the illustrations as a series of wooden arches is merely temporary, and will be replaced by steel in the permanent structure. Each archway supports a part of what might be called guiding pieces, which prevent the car from falling to one side.

The cars are large enough to hold 24 passengers. They contain their own motors, which utilize kerosene oil as fuel, steam being generated in an upright boiler and conveyed to a cylinder which moves a pair of sprocket wheels. The larger sprocket wheel, which is made especially heavy for the purpose, is joined to the axle of the forward truck wheel upon which the car moves, so that power is communicated to this wheel directly by means of a chain connection, and it may be termed the driving wheel. The car is supported upon

curved at the ends, meeting in the form of a V, and as the car moves, they pass between the spring blocks fixed to the archway. The guiding strips and the spring blocks are greased to reduce friction, and the arrangement is such that at least two pairs of spring blocks are continually pressing against the guiding strips. This device prevents swaying even on the most abrupt curves and when running at maximum speed. Ball bearings are utilized to overcome friction in moving the driving wheel, and this is one of the important advantages claimed for the system. Another claim is that the amount of friction is greatly reduced by the use of the single rail, even though the guiding strips on the top are continually in contact with the overhead structure. The fact that a load aggregating nearly five tons can be hauled at the rate of speed mentioned by an engine of such power is also advanced as a claim for its efficiency. The rates of speed given are maintained even upon the highest grades and sharpest curves. A company has been formed to build a railroad 16 miles long in Virginia embodying Mr. Tunis' ideas.