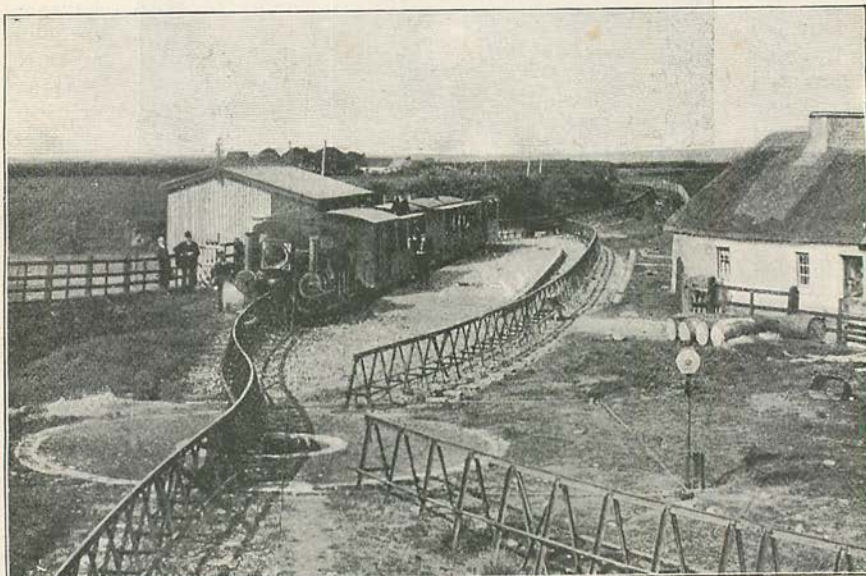


A Single-Line Railway.

BY WILLIAM SHORTIS.



From a Photo. by]

LISSELTON STATION.

[W. Lawrence, Dublin.



THE readers of THE STRAND MAGAZINE, I am sure, will be pleased to read of the very novel system of railway which runs between Listowel and Ballybunion, in the County of Kerry.

The system is known as the Lartigue Single Rail Elevated Railway, and is the invention of a prominent French engineer, M. Lartigue. It is the only one of its kind in the United Kingdom.

In passing, and before going into details of the system, it may be of interest to know that Listowel is the capital of North Kerry, has a population of about 4,000, and is considered to be one of the best country market towns in the South of Ireland. It is celebrated as being the centre of one of the best butter-producing districts in Ireland, the butter exported from here having a special quotation of its own on the English markets, and being known as "Listowels."

Ballybunion is a beautiful seaside and health resort on the Atlantic Ocean. It has immense stretches of sands, splendid bathing accommodation, and is remarkable for the wild grandeur of its cliffs and for the size and variety of the caves, which have been burrowed through the rugged rock by the never-ceasing toil of the great ocean which washes the western shores of the island. Though very recently brought before the public, Ballybunion is developing fast, and has more than

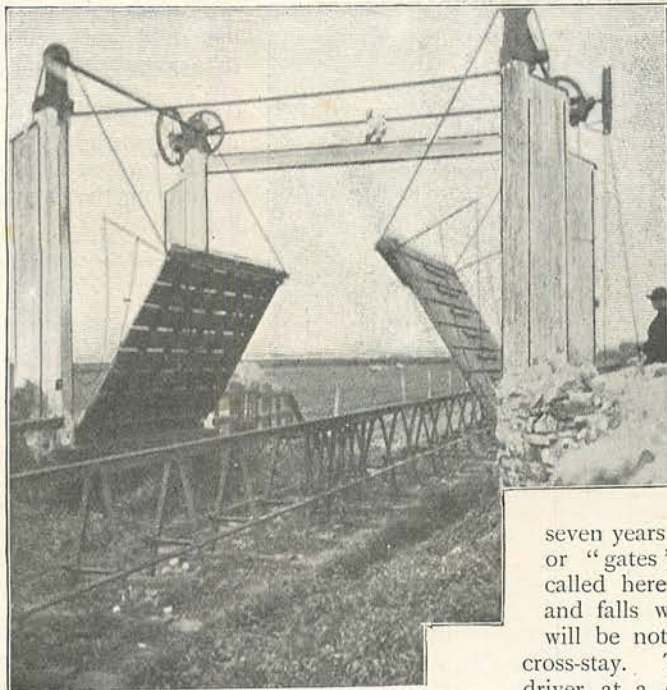
doubled itself within the past five or six years. It is the holiday resort of the people of Kerry, North Cork, and West Limerick. There is no doubt that when the tourist business of this country is developed Ballybunion will have its share, for no finer place to spend a holiday could be selected—what with good hotels, splendid bathing and grand scenery, etc., there is nothing to be desired.

But to return to our novelty. The line runs from Listowel to Ballybunion, a distance of ten miles, and was constructed in 1888.

This single line is composed of A-shaped trestles; the top rail, which weighs about 27lb. to the yard, is placed about 3ft. 3in. from the ground, the legs of the trestles are of angle iron, about $1\frac{3}{4}$ in. by $1\frac{3}{4}$ in.

At about 2ft. from the top rail is a cross-bar, and at each end of this there is a check rail to control the oscillating motion. At the bottom of the trestle is fixed the sleeper of dished steel: this is about 3ft. 3in. long by 6in. wide, and $\frac{1}{4}$ in. thick. The trestles are placed 3ft. 3in. apart. They are supported entirely by the metal sleepers, except in some places, where the ground proved to be soft, wooden sleepers of larger area are placed underneath.

At the stations, of which there are three, viz., Listowel, Lisselton, and Ballybunion, there are "switches," or "turn-tables," which are used for the same purpose as "points" are used on the ordinary railway—that is, for



BRIDGE RAISED.
From a Photo. by A. Stater, Gloucester.

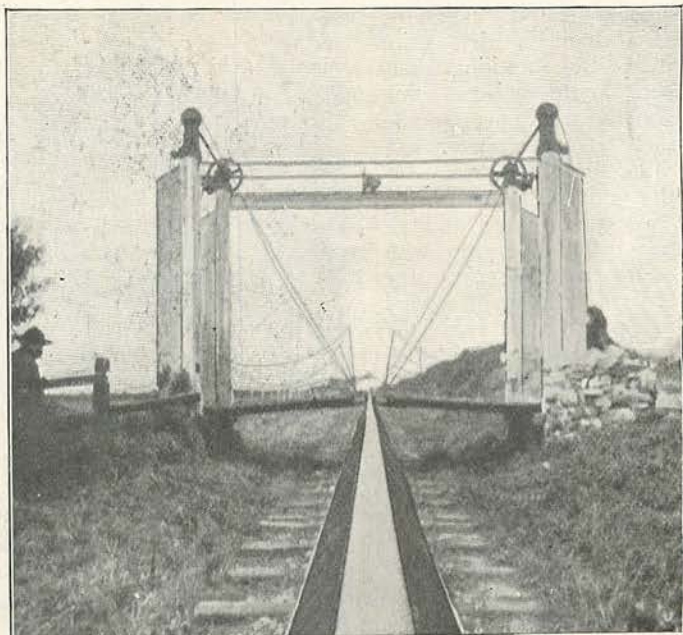
shunting trains from one line to another and on to sidings.

These switches are planned in a very ingenious manner, so as to get two "through roads." If the line were straight on the switch, one "through road" could only be obtained; and in order to pass to the other line each vehicle should be treated separately on the turn-table or switch. In this case, however, the line on the switch is curved to about 1-14th of its circumference, and thus two, and in some cases as many as four, "through roads" are obtained; so that shunting operations can be carried out with the same facility as on the ordinary line. The switches are fastened to the permanent line at each end by patent interlocking apparatus, and are connected with signals which are also interlocked, and which, of course, guide the engine-driver as to

whether the line is through or not.

As the line stands some 3ft. 3in. from the ground, it cannot be crossed on the level in the same way that ordinary railways can be crossed. Proper bridges are erected at the points where the different public roads cross the line.

There are, however, several occupation crossings, and these are provided with "fly" or draw-bridges, and in the photographs will be seen the mechanism for raising and lowering them, and which is the endless chain system. A child of seven years can raise or lower the bridges, or "gates" as they are more generally called here. A small signal which rises and falls with the working of the bridge will be noticed in the centre of the top cross-stay. This indicates to the engine-driver at a distance whether the gate is open for the train or closed against him, but open for the use of the farm yard or fields. It will also be observed that the trestles of the permanent way are strengthened at the places where these bridges lap on the top rail; this is to carry the weight of the



From a Photo. by]

BRIDGE LOWERED.

[A. Stater, Gloucester.

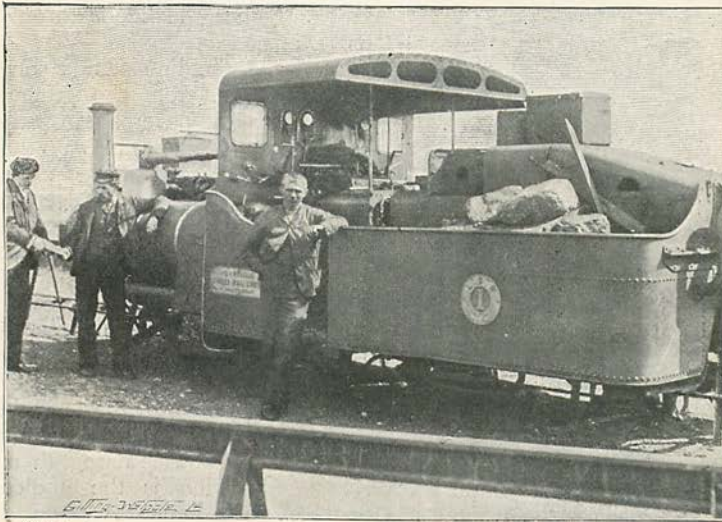


Photo. by]

THE ENGINE.

[R. A. Warren, Oltonnel.

bridge, as well as the different loads that pass in and out of the fields.

Next to the permanent way, the locomotives are perhaps the most interesting. As will be seen by the photographs, the engine has two boilers, two funnels, two fire-boxes; it also has two tenders and two tanks. The boilers are connected by equalizing steam and water-pipes, and thus work as one boiler, having an area of the two combined. There are two cylinders, 7in. diameter by 12in. stroke, the working pressure on the boilers being about 150lb. per square inch. On the tender—or, rather, on the space over the top rail between the tenders—is placed another two-cylinder engine with steam connection from the boilers, and was intended to be used to assist the main engine up steep inclines. In practice, however, this engine has not been availed of, as it is found that the main engine is well able to haul the loads required over the different gradients, some of which are very steep though short.

The engine wheels are 2ft. in diameter, and are,

of course, placed in line down the centre between each boiler, etc.

At a speed of fifteen miles an hour, the engines are capable of performing the following work:—

On the level they will draw 240 tons.

Up an incline of 1 in 500, 186 tons.

Up an incline of 1 in 45, 40 tons.

The latter is the steepest incline on the railway. The engines are capable of developing a speed of from twenty-five to thirty miles an hour. The

general working speed is from fifteen to twenty miles an hour.

By this time it will, no doubt, have occurred to the reader that a vehicle running on a single rail, however well balanced, must have some check. This check or guide is arranged for by an ingenious piece of mechanism,

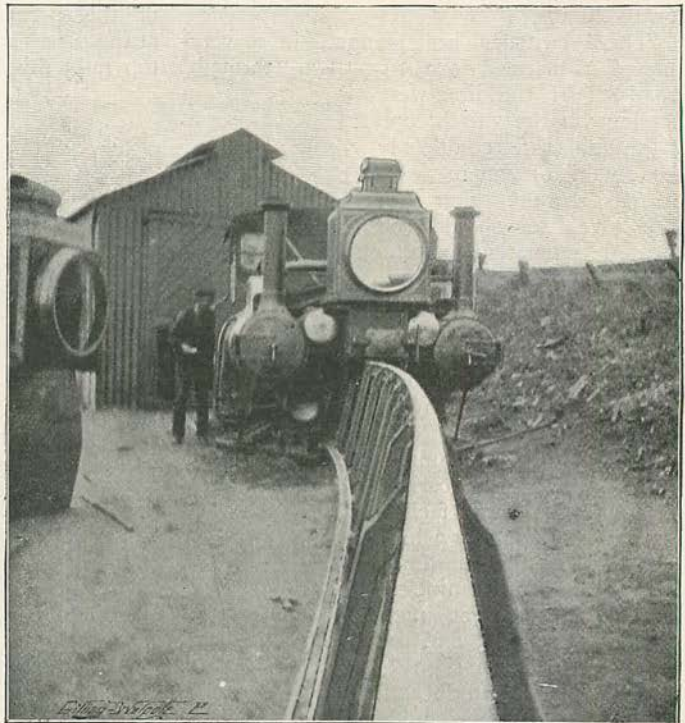


Photo. by]

FRONT VIEW OF ENGINE.

[A. Slater, Gloucester.

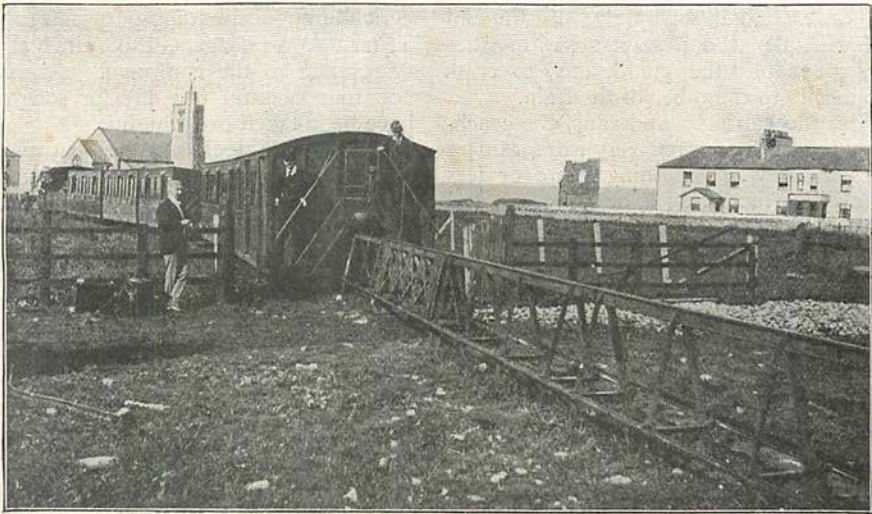


Photo. by]

VIEW OF FULL TRAIN.

[W. Lawrence, Dublin.

which consists of a broad wheel, on a vertical axle with spiral springs, being placed on each side of the engine or vehicle at about nine inches from the bottom. These wheels or rollers are known as guide wheels, and engage with the check or guide rails which are placed about two feet from the top rail on the A-shaped trestles, and which are alluded to in the description of the permanent way.

The guide wheels are not required to carry weight, being merely used to control the oscillation, and their run on the guide-rails is, so to speak, at right angles to the top or main wheels. There are four on each vehicle, two on each side.

Now, the rolling-stock of the coaching department, as on most railways, consists of 1st and 3rd class, and composite carriages, guards' vans, horse-boxes, etc. The traffic in horses and cattle may be written down as practically nil; the distance being short, the farmers do not see their way to pay the carriage for the conveyance of their stock.

The carriages, like the engines, are double; the passengers sit back to back, and except in few cases there is no internal communication between the two halves of the carriage, each of which hangs at either side of the rail, the intervening space being taken

up with the wheels and the mechanism for working the Westinghouse air-brake, with which each vehicle is fitted.

The wheels (four in number) are 19in. in diameter, and are arranged in line two at each end of the vehicle, each pair forming a bogey, which can take the sharpest curve at ease.

The carriages are about 7ft. high by about 8ft. 6in. in total width, and 18ft. long. Each carriage carries about twenty-four passengers—that is, twelve at each side.

The guards' vans have internal communication from one side to another, to enable parcels and luggage to be transferred across. The vans are also roofed in one, while the carriages, as will be seen in the photographs,

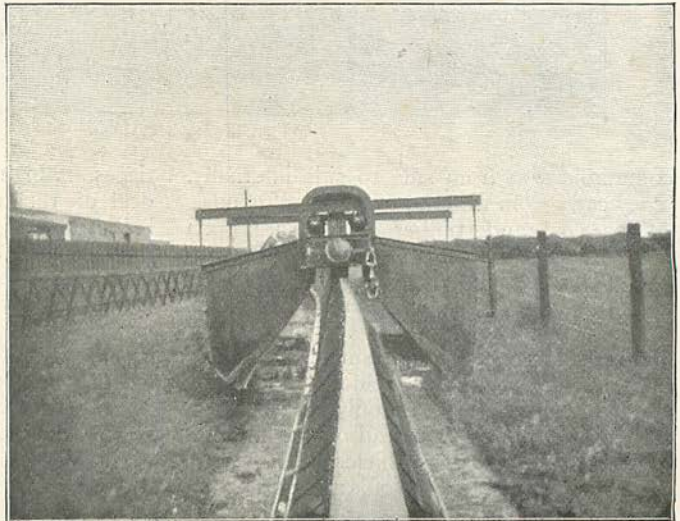


Photo. by]

END VIEW OF SAND WAGGON.

[A. Slater, Gloucester.

are roofed each half separately. At the end of each van is placed a stairway, with hand-railing, to enable the guard, etc., to cross from one side to the other of the train.

Besides the carriages and vans, the coaching stock consists of a few very extraordinary vehicles. They are nothing more or less than travelling foot-bridges, or staircases, and are placed about the centre of every train to enable passengers to cross the line. They are entirely distinct vehicles, having their own wheels, buffers, draw-gear, etc., and can be shunted about and placed in any part of the train.

The rolling-stock of the goods department consists of covered and open goods waggons, coal and timber trucks, and small iron vehicles known as sand waggons. The covered waggons are somewhat heavier than the passenger carriages, are the same length, but a little higher and wider. They are roofed, like the guards' vans, in one, and have

agricultural and building purposes, this traffic is, next to passengers, the principal source of revenue to the company. As many as 200 tons of sand per day for long periods have been taken over the line.

The rolling-stock of the entire system consists of from forty to fifty vehicles, including engines, carriages, vans, waggons, etc., and are repaired and maintained at the company's workshops at Listowel.

It is pointed out that the relative cost of this system and ordinary narrow-gauge lines on the same ground and for the same traffic will be as follows:—

The Lartigue system	...	£3,000 per mile.
24in. gauge	...	4,000 "
39½in. gauge	...	4,500 "

The advantages of the system are its great safety, and that the line can be quickly and cheaply laid; as earth-work is reduced to a minimum, it is only necessary to clear away sufficient material for the sleepers; the car-



From a Photo. by]

BALLYBUNION STATION.

[W. Lawrence, Dublin.

riages are high enough to pass clear of a good deal of rough ground. Another advantage is that by a slight modification of the design the line can be made its own bridge, and thus cross brooks, ravines, etc., without having to build piers, viaducts, or other expensive bridge-work. In some countries this design of railway must be very advantageous, as floods, snow-drifts, or sandstorms must be severe before either of them prevented the line from being worked. It is well known that a few inches of water, snow, or sand will seriously interfere with ordinary railways; indeed, the traffic is occasionally stopped for several hours even in England.

communication from side to side internally. They carry from three to four tons of goods. The coal and timber trucks are open vehicles, with the wheels and brake mechanism hidden in wooden casing. The wheels in all those vehicles are the same in number, size, and arrangement.

The sand waggons are smaller vehicles; they measure 10ft. long, including buffers, by about 6ft. wide. They have only two wheels on top, one at each end, instead of two forming a bogey as in the other vehicles. These little waggons carry three tons of sand, and as the sand off the shore and from the vast sand-hills at Ballybunion is sold at Listowel for