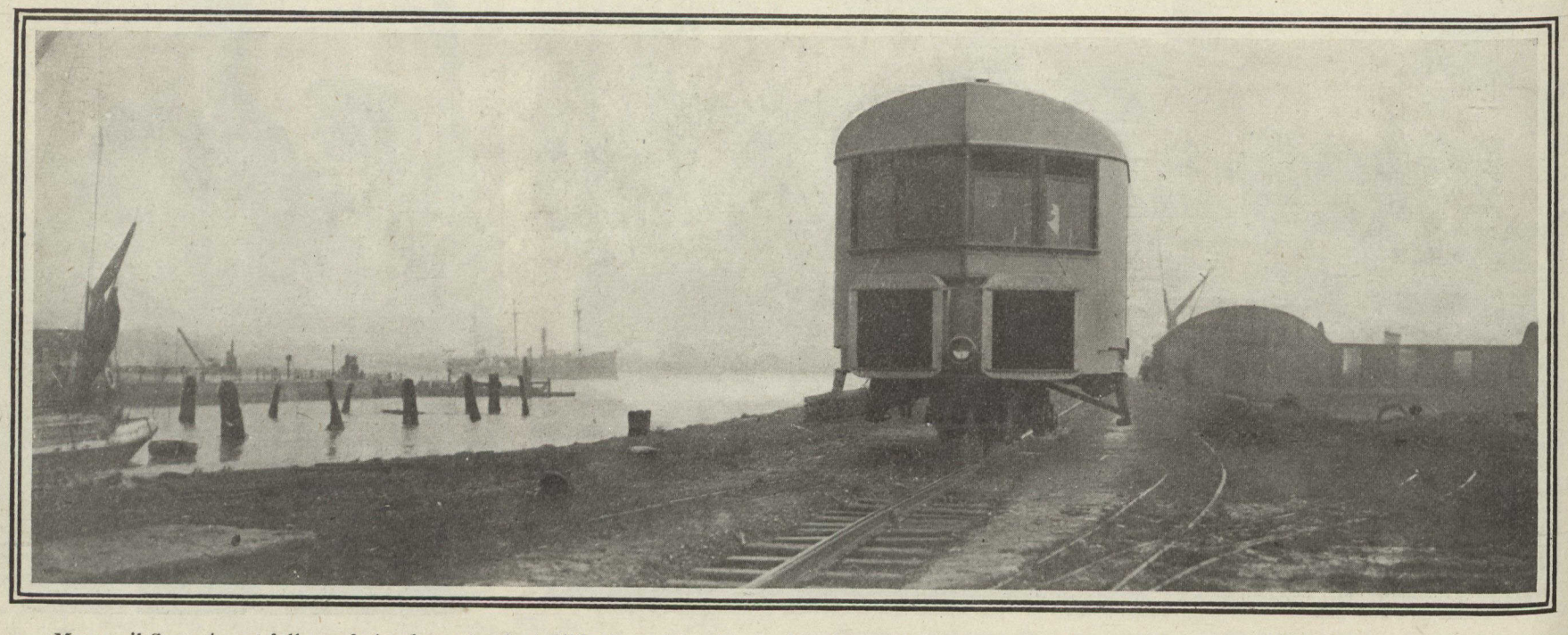
# ONE-RAIL LOCOMOTION AS A FACT



Mono-rail Car going at full speed ahead on a track at Gillingham, Kent County, England, where the gyroscopic locomotive was established as a practical fact.

YOU—thinking about your airship, are you interested in the mono-rail locomotive? It is sometimes called the gyroscope, which is merely the principle that makes the thing stay up and has nothing to do with its driving power which is steam or petrol or electricity, or anything else usable by a two-track locomotive. Now the gyroscope on a toy track and the real mono-rail car carrying passengers are as different as a toy and a practical experiment. On this page you see (1) a mono-rail car running at full speed ahead; (2) standing stock still and not toppling over; (3) going around a curve without leaving the track, all in absolute poise. This is the first of its kind in the world and it has recently been tested at Gillingham, in Kent County, England.

In the CANADIAN COURIER a few weeks ago there was a note about the first gyroscope railway in America, which is being built by the C. P. R. to go round Okanagan Lake and carry out fruit—which can be done by that kind of railway at a much lower cost than by the two-rail road. It will be remembered also that an English inventor is applying the gyroscope to balance the aeroplane.

This test-car at Gillingham, however, is the first mono-rail to be put into practical operation on a commercial basis.

It was constructed as a military vehicle; because it seems likely that warfare transports is the sort of use it will most be conveniently put to at first—on account of the fact that a military railroad has to be slammed up in a hurry; besides the gyroscope-locomotive is capable of negotiating sharp curves much better than a two-rail engine and car. Petrol was used for fuel; because on the principle of smokeless powder, steam is too visible for war, and because petrol is a concentrated fuel easy to carry for the power it gives.

But to begin with—how does the new-fangled contraption with one track fair in the middle stay up? If you were to look into the anatomy of the thing you would discover that there are two reasons; one on each side of the car in the shape of a gyroscopic wheel that revolves horizontally, each in an opposite direction to the other—though it may do so vertically if required—at 3,000 times a minute, which is fifty revolutions every second, popularly known as "going some." These whirligigs have nothing to do with going ahead; in fact, they run just as fast when the car is standing still or backing up; they keep the car balanced, that the gyro-wheels go in opposite directions.

Here is the way an expert elucidates the process of equilibrium as operated in the gyros. His main language is simple:

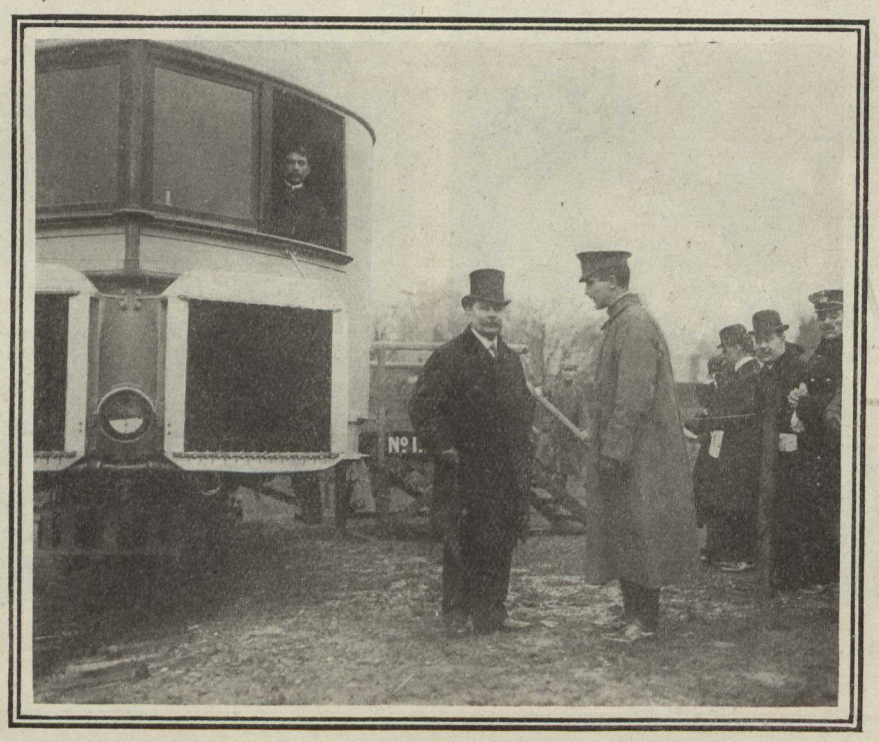
"Now, suppose the vehicle is standing perfectly balanced on the rail with the wheels revolving in their central position: no angular or as it is called 'precessional' movement of the cases containing the wheels about their vertical axes takes place, but if any force such as the wind, movement of the passengers to one side, or centrifugal action in going round curves, is brought to bear, tending to upset the car instead of its doing so, as one would naturally expect, it merely causes the cases containing the wheels to precess about their vertical axes at a rate depending upon the magnitude of the disturbing force; and it is by applying force to them in the same direction that they are moving that the car is caused to lean over so as to oppose and balance the disturbing force whatever it may be.

"In the existing car forces controlling precession are applied by means of compressed air acting on pistons suitably geared to the gyro-cases—the supply of air being obtained from an electrically driven compresser which also furnishes the air for the pneumatic brakes of the car itself and such trailers as may be connected to it."

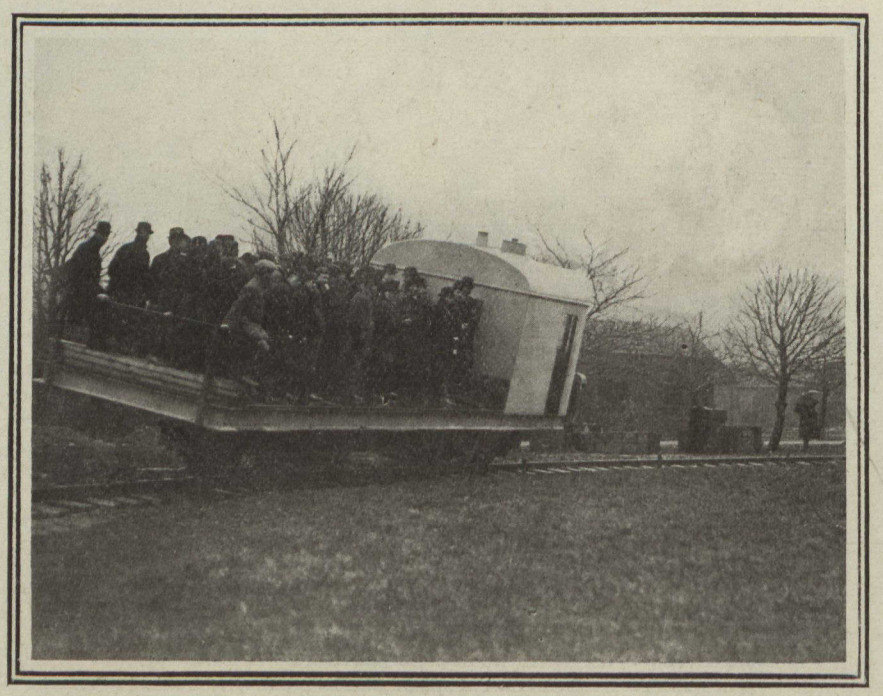
Other information is withheld at present because it is contained in patents now being applied for, which is good proof that this is a timely subject. The gyros are driven by a dynamo on board; which is operated by a small 20-h.p. engine, also used for lighting the cars, running the air compressor and propelling the car at low speed for shunting.

They say that the mono-rail locomotive has two advantages over the duo-rail, old-style; one greater speed and the other greater safety. What more could you ask? To be sure that you are absolutely safe even when going at a hundred miles an hour is more than you are willing to expect from any ordinary locomotive, any automobile or even an airship. Of course the absence of friction helps to account for the increase of speed. And even though the gyros should take a notion to balk on account of any accident to the dynamo they will continue to revolve for a long while with the stored-up energy. Furthermore, "the resultant of all forces acting on the vehicle is situated in the plane of both the road wheels and the rail, hence doing away with any tendency to derail."

If there is aught mysterious left in mono-rail technic the practical reader must be referred to the bicycle which is quite as unusual and is really a mono-rail locomotive with a universal track. Why does a bicycle fall when it stands and stand up when it goes? The reason for the latter would take as much space to explain as the mono-rail. The former is easy—because the bicycle hasn't got a gyroscope. In future bicycles will probably be equipped with gyros.




Mono-rail Car standing absolutely still in perfect equilibrium on the Track.



Mono-rail car negotiating a curve without tipping over or derailing.