## THE CENTRAL RAILWAY AND

that is better than that used on our road beds. Under present form of construction the ties are not sufficient to carry the heavy weights that are continually pounding over them. The ballast may be ever so well tamped under them, still we find the outer ends poorly supported. The ballast seems to work away from the ends, allowing the ends to spring down every time a heavy train passes over them, and means by which the ballast could be kept in place at the tie-ends would make a decided improvement, it seems to be a matter of first cost as to whether such improvement can be carried out or not. I believe we would have fewer accidents from broken rails if the road bed was changed for a new plan. From the statements I have made, you will naturally enquire what is the remedy or perhaps the enquiry will be, is there any remedy and have we reached the limit?

Recent developments in the use of electric traction have been so successful that we may hope for relief. The use of the single phase current for motors seems in a great measure to have opened the way, its many advantages for long distance transmission at high voltages and the methods of step down transformers now in use has removed many of the disadvantages of any direct current system. The electrical engineers of to-day have practically solved the problem of long distance transmission of electricity, and consequently are prepared to carry out power ideas that could not be entertained a few years ago. All these facts point to the coming change in the motive power for trunk lines of our best roads.

"The geographical situation of many of the railways is peculiarly adapted for this because of the great number of water powers that are crossed by their lines and in which lies enough power to handle successfully and cheaply many a hundred miles of line. Then again, the recent improvements in the use of steam in large power plants have been such that power can now be delivered at a small cost in fuel and attendance as compared to even the most economical of locomotives. A modern high class generating station of large power, if equipped with first-class reciprocating engines to use the steam from high pressure down to atmospheric pressure, will give the very best fuel results for the steam used, and as there is nearly as much heat left in the steam when it reaches the atmospheric pressure as the engines had used up to that time. We should supply a low pressure turbine to convert this heat into mechanical work, thus almost doubling the power of the engine still using the same steam or the steam that would go to the condenser of an ordinary reciprocating compound condensing engine, as the low pressure turbine would not require any valves or governing mechanism. It would be very cheap to install it. It should be installed between the exhaust nozzle of the reciprocating engine and the condenser, having a generator upon its shaft.

16