

ELECTRIC RAILWAYS.

Under present conditions the superiority of the electric current to steam, as a prime mover, is confined to positions where it is required to move a single car or two, frequently, instead of a large number at wider intervals. For the current the power is generated at a central station, and must at all times be equal to any demand upon it ; while in the other case it is self-contained in the locomotive engine, the number of which may be increased or diminished as occasion requires.

An electric installation to produce the same power as the best locomotive will cost nearly ten times as much as the single engine, and can only compete economically with the latter where the demand for power is continuous. Where a single locomotive could do the same work, the interest upon nine-tenths of the cost of installation would handicap the electric system.

When coal is used to produce the electric current, the cost per horse-power produced is the same as for the locomotive. When water power can be obtained the fuel cost is saved ; but, since this item forms less than 20% of the operating expenses of a railway, the amount saved may be fully offset by interest charges upon the cost of electric installation, including that of the water power.

For urban and suburban passenger traffic there is no comparison in efficiency, economy, comfort and safety to passengers, between electricity and steam : moreover, the frequency of cars and absence of cinders and smoke lead almost immediately to a very decided increase of traffic. On the other hand, a breakdown at the central station puts an immediate and total stop to traffic, while a disabled locomotive would be dragged off or replaced by another. Grades up to 10% and above are surmounted by the electric car—because there is a motor under every car—while less than half this is the practical limit on steam roads. A steam motor could mount the same grade, but would require a licensed engineer and a dangerous boiler to every car.

For heating purposes electricity requires 25 times the horse-power needed to produce the same heat by steam: for tram-cars it will always be preferred on account of greater convenience and cleanliness; and because of the moderate amount necessary, as compared with houses. It will always be used for these cars when water power supplies the current—and should be even with coal generation.

We cannot foresee the future of this question. If the heavy locomotive which carries no paying load, can be got rid of—lighter rails and bridges than are now called for can be used ; and if the momentum of trains can be utilized to produce the electric current, every car may be