largest possible loads with such economy as can be obtained, than that they should haul smaller loads at a cheaper rate per ton in regard to fuel.

The passenger service on main lines is more often a combination of express and local than either one of these chiefly. Thus the majority of through express trains have to stop at nearly all stations either by time-table or by signal. Special care is therefore required in designing the engines so as to combine free running with the quickest possible starting power; and a continuous brake is also rendered necessary as well as expedient for economising time in stopping.

In all classes of service the dead or non-paying weight hauled forms a much greater percentage of the total train than on an English railway. This is partly due to the fact of the freight cars having to be protected against the climate, and to the employment of specially designed refrigerator cars and ventilated cars for the carriage over long distances of perishable goods, such as fresh meat, fish, butter, cheese, &c. It is also partly owing to the strength of the passenger coaches being greatly increased with a view to the safety and comfort of the passengers; for it must be borne in mind that a through transcontinental train in Canada carries with it all the conveniences of a first-class hotel. The through trains on the Canadian Pacific Railway from the Atlantic to the Pacific ocean carry parlour, sleeping, dining and buffet coaches, with sofas, easy chairs, state rooms, smoking room, bath room, lavatories, &c.; all of which accessories to comfort necessarily add to the dead weight per passenger.

A portion of the traffic is worked by wood-burning engines, which require a special form of grate, and arrangements of wire-netting for the ash-pan and chimney in order to prevent setting fire to the surrounding country. For coal-burning engines the quality of the fuel is very variable; some of the coal is of such a kind as to necessitate rocking grates with dumping arrangements, sharp blast, and netting for arresting sparks; all of these appliances have to be used for maintaining efficiency, but they are somewhat detrimental to economy, inasmuch as to some extent they react upon each other.