

3.4 TRAIN AIR CONDITIONING

Queen Victoria's railway carriage was provided with ventilating apparatus in 1843. From 1863, England pioneered the use of gas lighting in trains and at the end of the 19th century Stone perfected self-generating and self-regulating electric lighting equipment. In America, George Foote introduced a system of ventilation incorporating air cooling by water jets. In India, R D Sanders made a number of first class carriages ventilated through water-drenched cloth by means of air scoops, the cloth being kept wet from an overhead tank. [TTT]

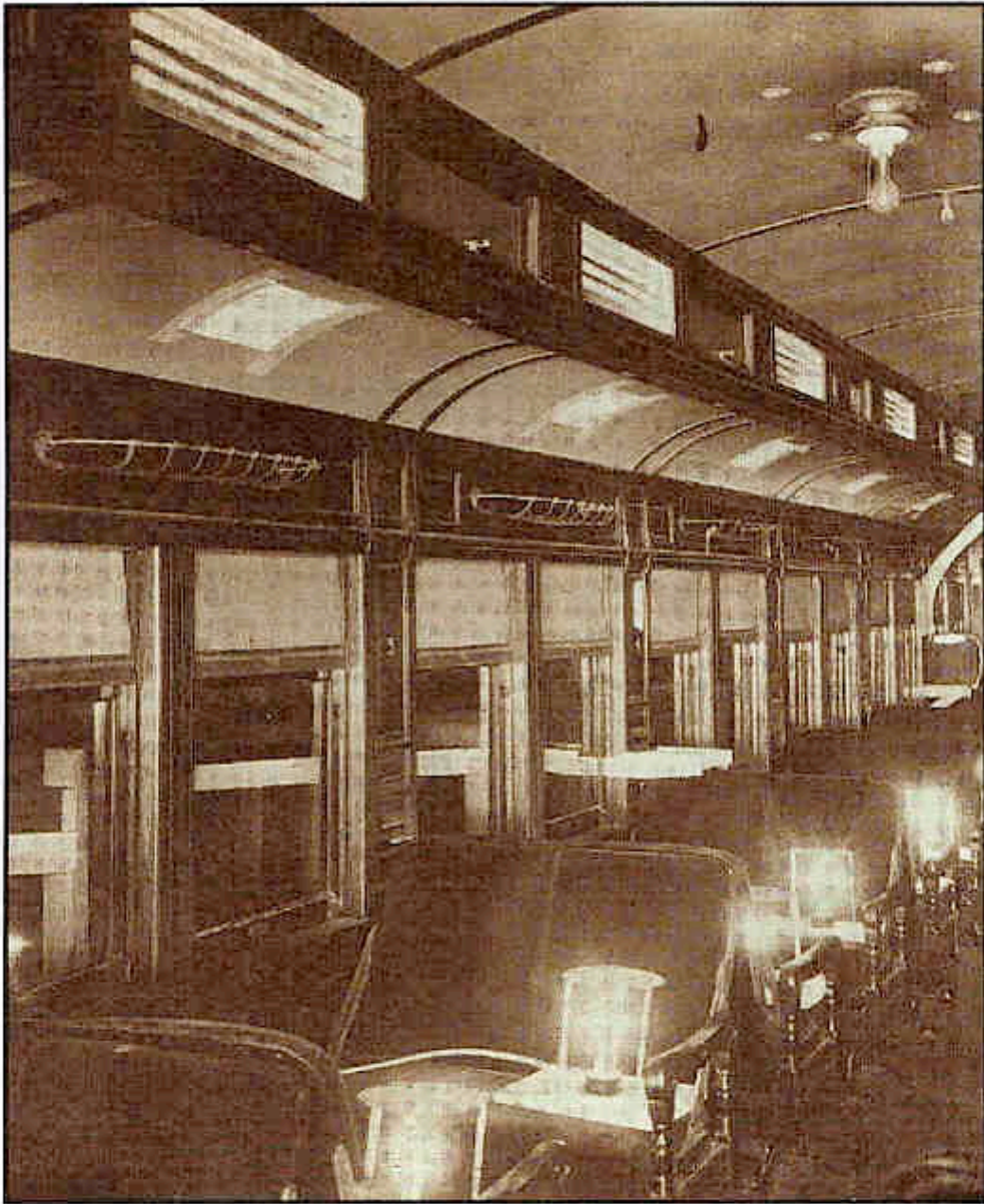
Back in 1884 the Baltimore & Ohio Railroad (B & O) tried unsuccessfully to cool a passenger coach by passing air over a huge icebox built at one end. In 1913 the Pullman Company asked Carrier Engineering to design a cooling system for passenger coaches but this was never progressed due to lack of suitable refrigerating equipment. [FAC, chap.X]

In 1929, B & O again asked Carrier Engineering to design a cooling system for a passenger coach. Willis Carrier devised a system using a 5 TR petrol engine-driven ammonia machine with a spray-type unit to cool and dehumidify the air and a similar unit to serve as a cooling tower. This was installed on B & O coach No.5275. After a period of testing, B & O ordered an air conditioning & refrigerating system for the dining car "Martha Washington" which formed part of the crack train "The Columbian," operating between New York and Washington. While the performance was good the practical problems were too great. Air distribution was faulty, petrol was a fire hazard, and a rocking coach did not favour open systems of water circulation. The electrical systems then in use ruled out a motor-driven compressor.

So Carlyle Ashley, with some assistance from Willis Carrier, put together a steam-jet refrigerating unit (actuated by steam taken from the railway engine) working with closed chilled and condenser water circuits. Next, an old wooden railway coach was purchased for \$400 and turned into a test vehicle by Alfred Stacey, who placed electric lights equivalent to the heat of people on the seats, and placed the entire coach in a heated enclosure. In August 1931, this test chamber was demonstrated to some 200 representatives of the rail road operating companies. Orders came in from the Santa Fe, Union Pacific, and Milwaukee Railroads, the latter for its crack train "The Hiawatha." Air conditioning became a standard feature on Pullman Diners and Sleepers [4/564].



*The air conditioned "Martha Washington" Dining Car, Baltimore & Ohio Railroad, 1930.
[CHC-12].*



*The Carrier Pullman air conditioning test coach, 1931 [4/464, page 16].
Note the electric lamps placed on each seat to simulate passenger heat load.*

The history of Stone of Deptford goes back to 1831, when the company made copper nails, rivets and other fasteners used in the building of wooden ships. From 1884, Stone began the manufacture of manganese bronze propellers, a field in which they became world leaders, later equipping the RMS Queen Mary and Queen Elizabeth. In 1894, Stone invented an axle-driven lighting system for passenger trains which quickly superseded all other systems and was adopted worldwide [19/515].

Shortly after the successful American tests on air conditioning passenger coaches, Stanley Groom of CEC in London introduced Kenneth Preston of Stone to Willis Carrier. The natural combination of Stone's experience of railways and their numerous contacts, combined with Carrier Engineering, a firm recognised as a world authority on air conditioning, resulted in the successful creation, in 1935, of the Stone-Carrier partnership [19/513 & 516].

The first Stone-Carrier order came from Australia, and was for the dining car "Spirit of Progress" for the Victorian Government Railways in 1936 [19/519]. South Africa built "The Blue Train," its first to be air conditioned in 1938. When the South African Railways decided to build a Royal Train for the visit of the Royal Family in 1947, the contract was awarded to the Metropolitan Cammell & Wagon Company who used Stone-Carrier for the air conditioning [19/516]. Also in 1947, Stone-Carrier received an order for 36 sets of air conditioning equipment from Indian Railways for their new "Gandhi" trains [19/520]. In 1954, the Queen visited Australia and the Royal Saloon railway coach was specially air conditioned. By the end of 1956, there were 298 sets of equipment in use in Australia [19/519].

Providing air conditioning for Royal Trains attracted much interest and publicity. The Egyptian Royal Train was constructed by the Fiat Company of Turin, c.1951, for the use of King Farouk. The train was lavishly equipped and fitted with Stone-Carrier air conditioning [19/521]. Also in the 1950s, Stone-Carrier provided air conditioning for two coaches to be used by the Emperor of Ethiopia, Haile Selassie, on the Franco-Ethiopian railway between Addis Ababa and Djibouti [19/522].

In 1959, Carrier Corporation set up Carlyle Air Conditioning & Refrigeration Ltd in a joint venture with what was then Stone-Platt, with CEC holding a 5% shareholding. The venture was not a commercial success and by 1966 Carrier had acquired the total shareholding [5/553].

Stone-Carrier also developed air conditioning equipment for motor coaches, their first installation being for the "Arcadian" built by Metropolitan-Cammell Weyman Ltd and claimed to be the first fully air conditioned road vehicle to be built in the UK [19/523]. Prior to this, Carrier air conditioning was provided in 1936 for the first air conditioned bus line belonging to the Nairn Transportation Company of Syria. In the USA, Carrier air conditioning was first installed in an intercity bus for Santa Fe Trailways in 1938 [CHG-12].