

Grapevine Cuttings (February 1999)

By Rob Upson

THE TRAM (Part 1)

The idea of applying steam as a motive power for travel commenced in Europe about the middle of the 18th century. In 1769 a three-wheel carriage built by a Frenchman, Nicolas Cugnot, became the first land vehicle to run on steam power. Travelling at an unstoppable 3 miles an hour, it ran into a wall and landed its inventor in gaol for being a danger on the roads.

Although the name of James Watt (1736-1819) is synonymous with the development of steam power, it was Richard Trevithick (1771-1833), a Cornishman, who, in 1804, first demonstrated a steam engine that hauled a load of iron and 70 people in five wagons over a distance of nine miles in Wales. But it was George Stephenson (1781-1848) with his steam engines *Locomotion* in 1825 and *Rocket* in 1829 that pioneered the public railway.

The Australian railway system began in 1854 with the opening of Victoria's first railway from Flinders St. to South Melbourne. A year later, NSW's first railway between the Sydney suburbs of Redfern and Granville, was opened and in 1856 the first steam railway in South Australia ran from North Terrace to Port Adelaide.

Prior to the arrival of the railway to Bendigo in 1862, passenger transport to the goldfields was by Cobb & Co. coach. The first coach service from Melbourne to Forest Creek and Bendigo began in January 1854 and before that, of course, you had to find your own means of transport such as bullock dray, horse and cart or, more commonly, shanks's pony.

Within the cities and towns of Australia at the time, passenger travel was by horse drawn vehicle, either a two wheel or four wheel carriage, the most well known of which was the hansom cab. This was a two wheel enclosed carriage for two passengers with the driver mounted behind and the reins going over the roof. It was named after its inventor, J.A.Hansom, an English architect.

The next phase of public transport in Australia was the introduction of **The Tram**. The first type of tram to make an appearance in the streets of Sydney was horse-drawn, and from 1861 to 1866, ran from the Redfern Railway Station to Circular Quay along Pitt St. Horse-drawn trams then made appearances in Melbourne in the 1870's, Adelaide in 1878, Brisbane in 1885 and finally, Ballarat in 1887.

In Adelaide, in particular, this type of transport proved very popular and by 1883 there were seven privately owned companies. Competition was very keen and in order to keep costs down, the poor old horses sometimes lacked adequate feeding. This led to the question being asked at the time, "What is the difference between the Adelaide trams and the Adelaide street lights?" Answer, "One has a set o'lean horses and the other has acetylene lamps."

Melbourne and Sydney were the only two cities to move to the type of tram system known as cable trams. We shall discuss this system and the further development of trams in Australia, next time.

(To be continued)

GRAPEVINE CUTTINGS (April 1999)

By Rob Upson

THE TRAM (Part 2)

The cable tram was an American invention and the first such system began operation in San Francisco in 1873. The hills of that city were too steep for horses or steam power and the cable trams were ideal, in fact they still operate there to this day. Both Melbourne and Sydney decided to adopt this form of public transport in the mid 1880's. Being large population centres they were able to justify the large capital cost of construction.

The trams were pulled along by a 1-inch diameter cable, which ran below the road in a slot between the rails. This continuous cable was kept moving, via pulleys, from an engine house located somewhere along the route. The tram consisted of two cars, the first car, called the dummy, had the gripping mechanism in the centre, with seating all around it and apart from the roof, was open to the elements. The second car, like a conventional tram, was pulled along by the dummy. The gripping mechanism, or gripper, was like an iron hand that reached down through the slot and grabbed the cable below. When the driver, or gripman, as he was called, wanted to start the tram he pulled one of the levers to make the gripper close onto the cable. To stop the tram he released the gripper from the cable and applied the brake.

The engine house was the heart of the system, consisting of a steam-generating boiler, one or two steam engines and a system of wheels and pulleys to keep the cable properly tensioned and moving at 15 miles per hour.

Melbourne's first cable tram line was opened in November 1885 and went from Spencer Street, along Flinders Street and Bridge Road to Hawthorn Bridge, about 3 miles. The engine house was located at the corner of Hoddle Street and Bridge Road, from where two cables ran, one to each end of the route. This engine house building was only recently demolished to allow for the widening of Hoddle Street.

Other cable systems soon followed and by 1891 Melbourne had a dozen or so routes from the city with 45 miles of track in all directions and 12 engine houses. The Melbourne Tramway and Omnibus Company, as it was called, carried 11 million passengers in 1885 rising to 46 million per year when all lines were operating.

The Company extolled the virtues of the cable trams in a booklet, which in part, said *'It is needless to dwell on the numerous advantages of the tramway system of Melbourne, as they speak for themselves. Suffice it to say that both Melbourne citizens and visitors all agree that the company's tramways are pre-eminent for cleanliness, comfort, agreeable motion, frequency and regularity of running, and a civil, attentive and capable body of employees. The cars run at a higher speed than could be maintained by horses and find no difficulty in surmounting grades and passing around curves. It is a satisfaction to passengers to know that for their convenience and comfort no tired horse is groaning under a heavy burden, and that the heaviest loaded car is drawn by the steam engines*

and wire ropes with perfect ease and no physical pain.’

When electric trams were introduced to Melbourne, commencing in 1906, they did not replace the cable trams immediately, but served as extensions to the cable tram routes. By comparison, the cable trams were slower and the systems were beginning to get rundown. It wasn't until 1926 that the cable trams began to be replaced with electric, but it was quite a slow process and the last cable tram ran on the Bourke Street route in 1940.

The hilly terrain of Sydney made it ideally suited to the cable tram system, however they only established two routes. The first route opened on the North Shore in 1886 and the second to Edgecliff, via Rushcutters Bay in 1894. However, electrification was soon embraced and the former cable system closed in 1900 and the latter in 1905.

Next time we shall return to the 1880's and hear about Bendigo's brief flirtation with the Battery Tram and its successor, the Steam Tram.

GRAPEVINE CUTTINGS (May 1999)

By Rob Upson

THE TRAM (Part 3)

In May 1887, the Councils of Sandhurst and Eaglehawk held a combined meeting, called *The Tramways Conference*, to discuss the linking of the two centres with a public transport system. Tenders were called and later that year, three proposals from different companies, all based on horse drawn trams, were evaluated and rejected. The cab industry in the region at the time was quite substantial with about 150 cabs utilising over 200 horses. There was a large infrastructure such as farriers, coachbuilders and grain merchants supporting this industry so there was significant opposition to any system that might threaten these livelihoods.

About this time, the Julien Electric Accumulator Car (or battery tram) had been developed in Belgium and details of this system were tabled at the April 1888 meeting of the Tramway Conference. It obviously received favourable attention, because Booth, Ellson and Co., civil and electrical engineers of Melbourne were contracted to install and operate, for 30 years, a battery tramcar system between Sandhurst and Eaglehawk and also between Kangaroo Flat and White Hills. In October 1888 the *Sandhurst and Eaglehawk Electrical Tramway Company* was formed.

However, elsewhere in Australia the battery tram was not exactly flavour of the month. A tram, based on the Julien system, was trialled in Sydney in June 1888 and in Adelaide in January 1889. Apparently Melbourne and Ballarat also conducted some sort of trials and Brisbane even contemplated it. The tram did not perform very well, particularly on hills and adverse publicity from other parts of the world made these cities shy away from this system.

Back in Sandhurst, it was 'full steam ahead' for the battery tram. (An unfortunate and prophetic remark.) Construction of the track commenced at the railway station in June 1889 and also the buildings for the depot and battery charging facilities in Mollison Street. Steam boilers, steam engines and dynamos provided the means of charging the batteries that were housed in rows underneath the seats down each side of the tramcar.

Eight cars were ordered from England for assembly at the depot and according to correspondence between Booth, Ellson and the City Surveyor in August 1888, '*... the cars will be similar in pattern to those in use on the Melbourne tramlines but will be capable of seating 16 persons, 8 on each side and having room for 6 in addition standing on the end platforms. No provision will be made for carrying any passengers on the roof nor will any open cars in the nature of a dummy be used on the lines. The car will have four wheels of 26 inches in diameter and a wheelbase of 6 feet. It will have four moveable windows and sliding venetians on each side, seats of perforated wood and*

sliding doors. It will be fitted with reversing apparatus, powerful brake gear, head, inside and flashing coloured lights. Electric warning bell and cash box. All fittings will be of wood and metal, no cloth will be used in any part of its construction. The complete car to be painted and varnished in a neat and workman like manner and in accordance with the very best style and most modern practice.'

Delays and strikes were to hinder the project and when the first car arrived in October 1889, the powerhouse wasn't finished and the batteries couldn't be charged. To test out the tracks this car was hauled by horses out to Eaglehawk and back. When all the equipment was ready, the first proper trial was scheduled for 10 April 1890. Derailments and electric arcing of the motors were only some of the problems that had to be resolved before the half-hourly service went into operation on 14 June 1890. There appeared to be no major opening ceremony or celebrations associated with the commencement of the tram service, not like the arrival of the railway some 18 years earlier.

Perhaps our civic leaders were a little embarrassed by the problems and maybe they were also hearing the unflattering stories of battery tram trials from other cities. Worse was to come. Derailments, minor accidents, electrical and mechanical breakdowns were common and the lack of power made it difficult at times to negotiate the hills. The batteries would sometimes not last the distance and run out of power before the tram was able to return to the depot. When breakdowns did occur, horses were used to tow the trams back to the depot, much to the delight of the cabbies who hung about waiting for extra fares. The system struggled on for 3 months until the Company, unable to improve the service and its public image, went into liquidation. Its assets were bought by the newly formed Bendigo Tramways Co. Ltd.

Council approval was given to operate steam driven trams and five small locomotives, called steam tram motors, were ordered from the USA. The battery trams were rebuilt and converted into trailer cars and each was hauled by one of these steam motors. They commenced service in February 1892 and proved to be very popular with the travelling public. The rolling stock was ultimately increased to eight motors and sixteen trailer cars. The economic depression of the 1890's contributed to the eventual demise of the Bendigo Tramway Co. which was unable to meet its commitments to improve or extend the system or even run at a satisfactory profit. The line between Kangaroo Flat and White Hills hadn't been built. The steam era came to an end in 1903 when the overhead electric tram system came into operation.

Bendigo wasn't the only Australian city to have steam trams. In 1882, Port Adelaide indulged in an unsuccessful experiment with steam and reverted back to horse-drawn trams. Newcastle commenced a steam tram service in 1887 until they converted to electric in 1923. Sydney began their steam tram services in 1879 with double-decker

trailers until electrification gradually took over between 1899 and 1912. Broken Hill had 3 steam motors and 6 trailer cars operating from 1902 to 1926 when buses took over. Maitland also had a steam tram system from 1909 until 1926. Finally, a narrow gauge (3'-6") system of steam cars operated in Rockhampton from 1909. Their steam motor and trailer were different in this system as they were built as one complete unit. The summer heat plus the heat from the steam boilers must have made travel on these trams somewhat oppressive. However, they stayed in operation until 1939, when they were scrapped.

(to be concluded)

GRAPEVINE CUTTINGS (July 1999)

By Rob Upson

THE TRAM (Part 4)

The next and final phase of tramway transportation began in Hobart in 1893 with the first electric overhead system in Australia. Initially run by a private company, it was taken over by the Hobart Council in 1914 and operated until 1960 when all routes had been replaced with trolley buses. In fact most tramway companies in Australia started out as privately run operations only to be taken over by State Govt. or Municipal Authorities.

Adelaide avoided some of the pitfalls of having different types of motive power by retaining the horse drawn tram until overhead electrification was phased in between 1909 and 1914. Conversion to diesel buses took place from 1953 to 1958, except the Glenelg line, which has retained its trams to this day.

Electric trams commenced in Ballarat in 1905 and ended in 1972, except for a short route on the shores of Lake Wendouree, which has been retained as a tourist attraction. Perth went to electric trams in 1899 followed by Fremantle in 1905, initially, both were separate and independent systems. The last tram to run in Fremantle was in 1952 and that in Perth was in 1958.

Brisbane went from horse trams to electric trams in 1897 and the last tram ran in 1961.

In Sydney, electrification of the tram system commenced from 1899 through to 1912 and they ended up with a very extensive network of routes. In the mid 1950s, the decision was made to scrap the trams and replace them with diesel buses. Commencing in 1958 the routes were closed down at regular intervals until the last tram in Sydney was run in Feb.1961.

Electric tram routes in Melbourne were commenced in 1906 and were initially used as extensions to the existing cable tram system. The cable trams remained in operation until the removal of the various systems was completed in 1940. Melbourne did not follow the other Australian tram cities and convert to buses and now has one of the largest remaining tram systems in the world today.

Other Australian cities to introduce electric trams and eventually replace them with buses were, Geelong (1912 - 1956), Kalgoorlie (1902 - 1952), Launceston (1911 - 1952), Newcastle (1923 - 1950) and Bendigo (1903 - 1972).

A new company comprising the Bendigo Tramway Co. and the Bendigo Electric Co. was formed in 1901 to introduce an electric tram system and work commenced on a new

depot at the east end of Arnold Street. The depot consisted of generating plant, sub-station, workshops, tram sheds and offices. The line was extended from the railway station to Quarry Hill and from Golden Square to Lake Weeroona and the new service commenced in 1903. Initially, 12 new electric trams were ordered. The steam tram motors were sold but the steam tram trailers were retained and used as trailers for the electric trams.

In 1918, the State Government constituted the State Electricity Commission of Victoria to control the generation and distribution of all electric power in the State. In 1934 the SECV officially took over the power generation and distribution of power in Bendigo and in so doing reluctantly inherited the tramway system. The same also happened in Ballarat and Geelong.

The SECV then had to embark on a programme of repair and replacement in order to bring the tramway up to an acceptable standard. However, by 1964 the trams and tracks were again in a bad state of repair and the SECV tried to justify the abandonment of the tram service. Remember, the SECV were in the business of power generation and supply and were not really meant to be in the public transport business, so it is understandable that the tramways did not receive much priority. By 1970 the SECV were successful in convincing the State Govt. that the provincial tramway systems were unviable and should be closed down. In 1972 the service ceased to operate, thus bringing to an end 82 years of public tramway transport in Bendigo. However, all was not completely lost. The trams were an important part of the city's history and the Bendigo Trust was given approval to preserve and operate part of the system as tourist trams and to be a permanent reminder of their part in Bendigo's development.

The 'Talking Trams' were officially launched in December 1972 by the then Premier, Sir Rupert Hamer, by breaking a bottle of local wine over the front of a restored 1925 Birney tram. Twenty-five years later this ceremony was re-enacted by the Deputy Premier, Pat McNamara, in celebration of its Silver Jubilee and hopefully the Golden Jubilee will be celebrated likewise. (I shall try and be there!!).

In concluding this brief journey into the history and development of the tram in Australia and Bendigo in particular, I shall put to you what are reputed to be two origins of the word TRAM and you can take your pick as to which one is the more plausible.

In Britain, in 1776, during the industrial revolution, a James Outram introduced iron rails at the Duke of Norfolk's colliery in Sheffield. The word TRAM is an abbreviation of his name.

Or, it is derived from the German word *traam*, referring to the wooden tracks on which mining trucks ran, as long ago as the 16th century.

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