

## THE GRENVILLE STEAM CARRIAGE

The Grenville Steam Carriage is believed to be the world's oldest, self-propelled passenger carrying road vehicle still in working order. It was built about 1875 by R N Grenville of Butleigh Court in Somerset, and G J Churchward, later Chief Mechanical Engineer of the Great Western Railway. They were premium pupils together in the Newton Abbot workshops of the South Devon Railway.

The carriage, which has seats for six passengers, including the driver, is powered by a twin-cylinder horizontal engine supplied with steam, at 120 pounds per square inch by a coal fired vertical boiler. The driver steers with a tiller linked to the single front wheel; the controls consist of a throttle lever, a reverse/cut-off lever and pedal operated foot brakes and whistle. At the rear the fireman maintains the water level in the boiler by means of a feed pump driven from the second motion shaft, and an injector for use when the vehicle is stationary. The crankshaft extends the full width of the vehicle and is geared with the second motion staff on the near side. An epicyclic reduction gear can be engaged by a dog clutch for climbing hills. A differential is fitted on the off side end of the back axle. The carriage will attain a speed of just under 20 mph on a level road, and consumes about 4/5 gallons of water and 5/6 lbs of coal per mile.

The carriage was used in the Glastonbury area for about 20 years and then converted for use as a stationary engine to drive a Cider mill. It was 'rediscovered' in the late 1930's and overhauled by John Allen & Sons of Cowley, Oxford. It ran in 1946 to lead the London Jubilee Cavalcade through Regents Park. Captain P L Neville, nephew of the builder presented the carriage to Bristol City Museum in 1947 and it has recently been overhauled and restored in the technology department workshops.

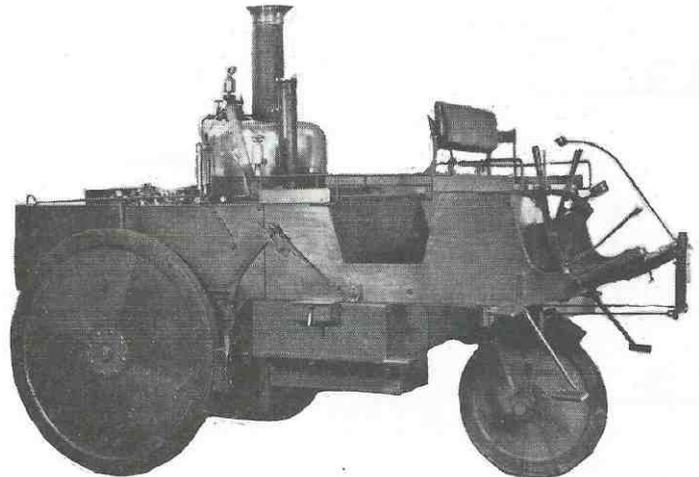
This unique exhibit from the City Museum's Technology collection was recently back on the road after 30 years. The Grenville Steam Carriage ran in the Lord Mayor's Jubilee Parade through Bristol on 11th June, 1977, driven by Paul Elkin, Curator of Technology at the City Museum and Art Gallery, with Fred Lester the other half of the museum's technology department staff of two responsible for the hot and messy job of firing the boiler and oiling the gears at the back of the carriage.

The steam carriage which last ran before presentation to Bristol Museum in 1947, had been restored to working order just before the Second World War but needed a major overhaul before it could be operated again. Paul Elkin and Fred Lester had quite a hectic week getting the steam car through its MOT test - the boiler feed pump and injector took a bit of sorting out and without any proper brakes the MOT inspector took some convincing. However, eventually all went well and the carriage was passed for use on the roads.

During the procession the carriage used a full tank of de-ionised water - over 50 gallons - and had to be topped up

with 10 gallons during a 'pit stop' at the museum in Queens Road. Records in the museum mention that in its heyday in the 1880's and 1890's the carriage which weighs 46 cwt would consume 5-6 lbs of coal per mile. Perhaps she was a bit thirsty this time because low gear was used throughout the run although Paul Elkin found that the carriage would easily reach about 20 mph for short distances in high gear on the flat and used surprisingly little coal.

Unfortunately, the carriage is off the road again for a while because the boiler insurance company have called for modifications to the flanged rings which bolt the outer shell of the small vertical cross tube boiler together. The present boiler was made by Shand Mason and Co. in 1938 but the boiler surveyor spotted that for some reason the flanges holding the replacement boiler together were only half the thickness of the ones on the original boiler. So, no more runs until that is done. Jefferies of Avonmouth have been contacted by the museum and the modifications will be carried out shortly after the Bristol Industrial Museum opens in March 1978.



### TECHNICAL DATA

**Weight of Vehicle (full working order) - 5150 lbs.**

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**Boiler:** Vertical with working pressure of 120 psi and 50 x 1" diameter inclined water tubes

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**Heating Surface:** Total 29 sq ft (13 sq ft in the firebox and 16 sq ft in the tubes) **Grate Area:** 2½ sq ft

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**Water Capacity:** Boiler 35 gallons. Water Tank 50 gallons.

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**Engine:** Twin-cylinder simple horizontal 5" bore x 6" stroke.

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**Reversing/Valve Gear:** Slide valves between cylinders operated by Stephenson link motion.

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**Gear Ratios:** Crankshaft to second motion shaft 1 : 1 spur gear combined with 2 : 1 epicyclic reduction gear engaged via dog clutch. Differential 1 : 4.