

Electric caulking machine, c1902



Description

This is a posed black-and-white photograph showing three men, watched by two others, moving an electric caulking machine into place above a pipe joint for the Coolgardie Water Supply pipeline in Western Australia around 1902. The machine is mounted on a trolley that rolled on four wheels along the top of the pipe, from one joint to the next. The words 'Premier No Leak' have been painted on the machine's cable drum. The photograph measures 20 cm x 16 cm.

Educational value

- The photograph shows pipes being joined for the Coolgardie Water Supply Scheme, an engineering feat that attracted worldwide attention at the time and has subsequently been declared an Australian national engineering landmark.
- The Coolgardie Water Scheme pipeline that opened in 1903 immediately solved water-shortage problems resulting from the gold rush that began in the 1890s when prospectors rushed to Western Australia's inhospitable eastern regions following amazingly rich discoveries at the locations later known as Coolgardie and Kalgoorlie. Men literally died of thirst in the arid country, while others died of diseases that spread due to a lack of sanitation and clean water. The gold-mining industry also needed water to develop, but attempts to obtain water from local underground sources and dams proved unsustainable and finally the pipeline from the coastal region was built at great expense.
- The mechanised process of 'caulking' or waterproofing the joints in the water supply pipeline involved fitting caulking tools into the two half-circular frames seen in the photograph, one over the top of the pipe, the other underneath. The tools moved backwards and forwards, plugging any space between the pipes and the ring with lead to prevent leaks. Unlike manual caulking, a caulking machine applied equal pressure on both sides of the pipe and both sides of the joint ring. The electricity that powered the machine came from a generator (not visible).
- This electric machine was designed to minimise hand-caulking by men using caulking hammers, tools that looked like blunt chisels, to force lead into a ring placed around the join between two pipes. It was also intended to improve the



Categories: The Pipes

quality of the joints since men working in cramped, exposed conditions for long hours in the pipeline trench could not produce uniformly good work.

- Caulking by hand was slow, and experienced and skilled caulkers were scarce. The steel pipes moved under even a light blow from a caulking hammer, making a totally waterproof joint almost impossible. Packing lead by hand was particularly difficult on the underside of the pipe, since the men were virtually working upside down.
- Invented by James Couston, the electric caulking machine promised to speed up the rate of joining the 60,000 pipes in the 560-km long pipeline but, when the first machines went into service in March 1901, they were not as efficient as hoped because the operators needed extensive training and experience. Although trials showed machine-caulked joints remained watertight at hydraulic pressure of 2.76 megapascals, whereas hand-caulked joints would leak slightly, the gains in efficiency were reduced because the areas around the locking bar longitudinal joints still had to be finished off by hand.
- The photograph shows all the equipment, apart from the generator, used in the mechanised caulking process. As well as the caulking-machine itself, there was a wheeled trolley for ease of transport, a cable drum and portable oil-engine. The caulking machine was driven by an Australian-built spontaneous ignition engine. The electric motor can be seen on the frame of the machine that sits over the top of the pipe joint. The underframe of the engine carried a dynamo belt-driven off the engine flywheel. Current was transmitted through a cable coiled on a drum attached to the back of the trolley. A plug connected the cable to the motor and the motor was belt-connected to a shaft which worked the racks holding the caulking tools by intermediate gears.
- The caulking machine was controversial, attracting parliamentary and newspaper criticism relating to its cost and labour issues. The WA Government bought the patent rights for the machine at what was considered an exorbitant price and employed the inventor to supervise its use. There were even allegations that the machine's inventor bribed government officials. Hand-caulkers initially resisted the introduction of the machine and the newspapers printed their grievances. The Public Works Department's speed in joining the pipes by machine was also disappointing and the inventor eventually completed the pipeline joints under a private contract.
- The photograph shows a caulking team, which included three men to work and transport the machine, a mechanic for the engine and dynamo, and two hand-caulkers to finish off the lead joint (their tools are probably wrapped in canvas on top of the trolley). The other two men in the photograph are probably an inspector and a supervisor, who were responsible for ensuring quality work, an indication of the importance of effective joints. The workers' clothes include hats, coats and waistcoats, despite the hot and dirty conditions, while the supervisors appear in full three-piece suits.
- The name on the machine, 'Premier No Leak', suggests that there was rivalry between the caulking teams. Some teams gave themselves names and competed with each other in a manner similar to that of the gangs unloading the pipes from trains, in an effort to be the best and fastest at their job. This rivalry would have been encouraged, as it sped up the construction of the pipeline.

Copyright Reproduced courtesy of Battye Library

Creator Unidentified

Identifier Battye Library number 013536D

Source National Trust of Australia (Western Australia) <http://valuingheritage.com.au/>



Categories: The Pipes