

From Ship to the Bush: Ship Tanks In Australia

MICHAEL PEARSON

Dotted about the Australian landscape in the most unexpected locations are large square rusty iron tanks. These cubic, mild steel containers are called ship tanks, and had their origin as shipping containers for water or perishable goods. The author, Michael Pearson, a heritage management consultant based in Canberra, has been intrigued by these objects for many years, having found them adapted for many purposes including dog kennels, water tanks, coolers for whale oil, eucalyptus distilleries, reinforcing collars for mine shafts, and perhaps most poignantly in the form of the bêche de mer boiler used in 1881 by Mrs Watson as a boat for her escape from Aboriginal attack on Lizard Island. Mrs Watson died in her attempt. Being unable to find any readily accessible information about ship tanks, Dr Pearson decided to trace their story.

This paper might be described as a piece of unabashed antiquarianism – it is not dripping with great research significance, though as a study of an interesting and poorly understood artefact type common in the Australian landscape I think it is illustrative of a characteristic of frontier society still little studied. The prevalence of the ship tank in rural Australia reflects the extensive recycling of manufactured items for alternative purposes, a trait necessary for survival, or at least comfortable living, in a society that is isolated from the source of purpose-built manufactured products. The examples given in the part 3 of the paper, while not meant to be exhaustive, are an indication of the range of situations in which ship tanks were recycled.

The classic ship tank is a mild steel (or wrought iron before the 1870s) cubic tank about 4 feet (122 – 123 cm) square, with rounded riveted seams on all edges and a single circular hole or filling port of between one and two feet (30 and 60 cm) diameter located centrally or to one side of one face of the cube, and reinforced by a steel lip with stepped wedges around its edge. While this sized tank is the most common, ship tanks are also found in 3 feet (92 – 97 cm) and 2 feet 6 inches (72 – 77 cm) nominal sizes. Exact uniformity of measurement within each of these sizes does not seem to have been achieved with the system used for manufacturing ship tanks. The single hole in the tank was sealed with a cast iron circular lid, with a smaller diameter projection on one side with a number of protruding lugs around its edge, which engaged the wedges on the filling hole rim to enable the lid to be screwed tight. On its other side the lid often had an iron rod welded or cast across an indented area. This external face of the lid was often cast with its maker's name and address in raised lettering. Most lids, though not all, have a central hole of about 8 cm diameter, which held a cork, wooden or soft metal bung, sometimes still found in position.

While this is the classic form of ship tank found in the Australian landscape, ship tanks had a very varied development, and came in a wide variety of shapes and sizes, of which the cube, being that used for the shipping of perishable goods, became the most common form to find itself devoid of its original purpose and hence available for recycling for land-based uses. To a small

extent, modern shipping containers are now being used for alternate purposes in land-based contexts, providing an interesting example of continuity in recycling.

THE DEVELOPMENT OF THE SHIP TANK

The ship tank was invented by Richard Trevithick, the prominent Cornish engineer of the industrial revolution, and his partner John Dickinson, in 1808. Their patent specifications of 31 October 1808 described well the advantages of developing the new container, which was the first to challenge the wooden barrel in its particular uses. The new ship tank was described as being for:

...the purpose of containing, enveloping, preserving and securing from damage the several articles of merchandise and other goods, whether in the solid or in the liquid form, which are taken on board ships and other vessels to be transported or consumed... And further, we do make our said packages, vessels or receptacles of such figures or forms that they fit exteriorly to each other without waste of space which takes place in the storage of wooden casks. For this purpose different forms may be used, but we prefer rectangular, or hexagonal prism forms to all others. Where this same economy of room is not requisite, we employ the cylindrical form, but whichever form be employed a much larger quantity of goods can be stored in an equal space by means of our Invention than can be stored in an equal space when the goods are put into packages made of wood, the sides and ends of which are necessarily of a great thickness compared with those made of iron... For some purposes we have our said iron packages, vessels, and other receptacles tinned on the inside, or coated with a varnish suited to the commodities they are destined to contain.¹

The pamphlet which made these claims also contained a testimonial from Sir Humphry Davy attesting to the capacity of air tight iron tanks to keep water fresh, and it was in the storage of water that the ship tank saw its most enduring use over the next century and a half. Trevithick and Dickinson set up a manufactory for their tanks at 72 Fore Street, Limehouse, London, but went bankrupt in

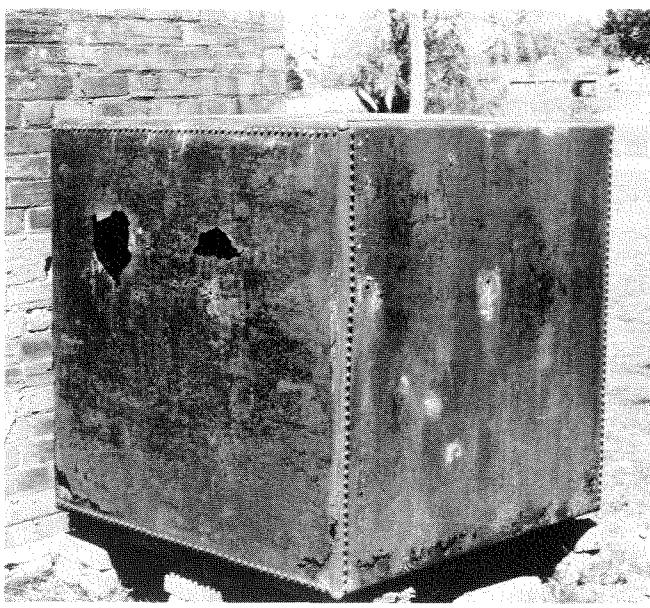


Fig. 1: Standard ship tank, used as a water tank at Hill End, NSW.

1811. The patent was taken over by Henry Maudsley, the engine manufacturer, who went on to make a substantial profit from it.²

Ship tanks used to store drinking water or perishable dry goods were hermetically sealed by the use of the tightly fitting lid with a fitted rubber sealing ring, which was screwed tight with the aid of the lugs cast into the lid and wedges cast into the rim of the loading hole. The iron rod welded across the outer face of many lids was to give a purchase for screwing the lid tight. Air was partially excluded, to produce a partial vacuum and hence a tighter seal, by lighting a candle inside the tank before sealing it, either by screwing down the lid or by driving a bung into the central hole in the lid.

The British Admiralty had been testing the tanks in naval ships from before 1811, and in 1813 fitted iron water tanks to HMS *Amphion*. Tailored tanks 4 feet square and 8 feet long (1.22 metres x 2.44 metres) were also fitted to a whaler by the well-known whaling firm of Bennett and Co.³ From this time onwards ships increasingly used metal tanks fitted to the run of the ship's hull to store water, either for drinking or as liquid ballast. Tanks, either cubic in form or fitted to the ship's shape, were also used for storage of perishable goods. Specifications for sailing ships built by Alex. Stephen of Glasgow in the 1860s–1870s period included such requirements as:

- 6 bread tanks, iron, galv'd
- 2 bread tanks, 20 cwt each fitted to run of ship
- 2 bread tanks, capable of containing in all 40 cwt of bread
- Tanks for bread capable of holding 20 cwt, etc. ⁴

The galvanising of tanks was not available, of course, until the first commercial use of that process in 1838. Before that time the tinning and varnishing referred to in Trevithick's original specification were the only coatings available. Later in the century at least, painted tanks were also available. A number of galvanised tanks have been found in Australia, but the majority are externally untreated (or may have lost their original painted finish).

Square ship tanks were also used for both water storage and for the storage of perishable goods, and as such found

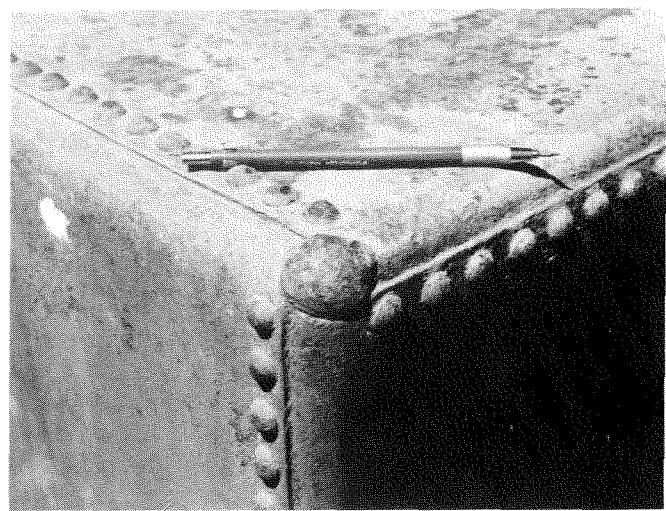


Fig. 2: Detail of the corner of a ship tank, showing the patented corners and rivetting pattern.

their way to all corners of the world. Some early surviving examples are three ship tanks (described as 'ballast tanks') built into the walls of a cache of emergency food and equipment left by Captain Henry Kellett on Dealy Island in the Canadian Arctic during the search for the lost Franklin expedition in 1853. These appear from photographs to be early examples of the 4 foot cubic tank, with rivet lines on the edges and across the middle of each face. They were used to store canned meats, soup, vegetables, hardtack bread, Normandy pippins (dried apples), and baking powder.⁵

The use of ship tanks in Australia is dealt with in section 3, but (from personal observation) they were also used for a variety of purposes ashore in New Zealand, and presumably in other countries experiencing rapid settlement in the nineteenth century.

An 1883 catalogue advertisement for Frederick Braby's ship tanks gives some idea of the wide range of uses of tanks at the height of their production.⁶ Braby offered tanks in two sizes, 4 foot (1.22 metres) square holding about 4.5 hundredweight (229 kg) of goods or 400 gallons (1820 litres) of liquid, and 3 foot 2 inches (0.96 metres) holding 200 gallons (910 litres) of liquid. The tanks came in two qualities, differing in the thickness of the iron plate used. The lighter tank was for dry goods, and the heavier for liquids, though the lighter was adequate for water storage on dry land. Both types are found in Australia. The recycling of the tanks was one of their selling points – Braby stated that:

These tanks are now extensively used as Packing Cases, they being found to convey goods more safely and free from damage by water, &c, than do ordinary wooden cases. The cover is hermetically fastened down after the goods are packed. They are readily sold at a good profit when they arrive abroad, especially in the Colonies, where they are eagerly bought up for use as water tanks, for which ultimate purpose they are appropriately made.

Braby offered his standard tanks (painted or galvanised) with a 15 inch (38 cm) diameter filling hole, but optional extras included 18 inch (45.7 cm) and 24 inch (60.9 cm) filling holes. Other options included an internal coating of 'Patent Enamel Cement', tanks with tops held on with bolts so the whole top could be

removed, the fitting of holes for later insertion of taps, brass cocks for later fitting, and special treatments for containing oil, turpentine and other purposes. Standard uses listed by Braby were for water, malt, hops, fruit, biscuits, bread and 'merchandise generally'.

Many ship tanks still show a 'shadow' effect on at least one face, where a product label had been pasted which has since peeled off. I know of two examples where the labelling is intact. One tank was seen by the author in the roof space of the Mint Museum building in Macquarie Street in Sydney, the lightweight tank being decorated on one complete side with a red, yellow and green paper label declaring its contents to have been 'Terry's Confectionary and Chocolates, Eight prize medals, York England'. Another tank is reported by Miles Lewis at the Kew Lunatic Asylum, bearing a 'Keen's Mustard' label.⁷

It is usually impossible to identify where a particular ship tank was made. The only part of the ship tank to be labelled with the makers name was the cast iron lid. All but one of the ship tank lids that I have seen in Australia indicate London manufacturers. Some London companies seem to have had a long history of tank production, as an analysis of London trade directories shows. A perusal of Kelly's Post Office Directories at intervals between 1856 and the 1940s show at least 54 different manufacturers of ship tanks located in London during this period (listed at Appendix 1), and an even greater number of companies manufacturing 'iron tanks' without specifying ship tanks. Some manufacturers were very long-lived, for example John Bellamy – son of the partner of the firm Burney and Bellamy which itself manufactured tanks from some date before 1856 until the 1860s – is listed as producing ship tanks from 1865 until at least 1934, and Frederick Braby & Co. from 1872 until the same date. Both companies were still listed in the 1960s, Bellamy still as a 'tank maker'. Two other producers, W.B. Bawn & Co. and Lancaster & Co., started manufacturing as Lancaster and Bawn in the 1870s, and are listed as tank makers in their own right from the 1890s till the 1930s, and were still in existence (as cloakroom manufacturers and galvanisers) until at least the mid 1980s. Examples of each of these company's ship tank lids have been located in Australia.

Information about ship tanks is elusive, and I have not been able to identify when the square ship tanks ceased to be used for cargo storage, but suspect that they were in use at least up until the Second World War, given that some manufacturers were still listed as 'ship tank makers' until the mid 1930s.

SHIP TANKS IN AUSTRALIA

Ship tanks were probably used for carrying ship's victuals and water storage, and for cargo stowage on ships coming to Australia from an early date, given the long voyage times involved and the difficulties in keeping drinking water and perishable goods fresh while at sea.

The earliest documentary evidence of ship tanks in Australia, supported by the earliest surviving examples of the tanks themselves, is provided in connection with the settlement of Port Essington in the Northern Territory. In 1838 thirty four ship tanks, which had been left on a wharf in Sydney by the storeship HMS *Buffalo*, were loaded aboard HMS *Alligator* when it set off to establish Victoria settlement in Port Essington. They were to be used to stow bread, sugar, clothing and other stores which might be attacked by termites and other insect and animal pests.⁸

One of these ship tanks is shown in a view of the settlement drawn in 1839 by LeBreton of Durville's expedition which visited Port Essington in that year. The

tank is shown, apparently abandoned, together with barrels and other gear, near the cannons in the settlement's fort.⁹ The author saw one surviving ship tank at the settlement in 1990, which matched LeBreton's sketch and was very similar to the tanks incorporated in the Dealy Island store in the Canadian Arctic. The tank had a row of rivets down the centre of each face, and an oval filling hole, features not seen on later tanks. A second ship tank is said to survive at the site.

The next firm evidence for ship tanks in Australia, found so far, is part of a photographic panorama of Adelaide taken in about 1865 by Townsend Duryea, which shows about 18 ship tanks located behind a row of cottages.¹⁰ From the 1870s onwards photographic evidence becomes more common. For example there is a photo of Circular Quay in Sydney, dated November 1870, which shows a number of ship tanks near Campbell's Wharf,¹¹ and a photo in the famous Holtermann Collection shows a ship tank outside a wheelwright's shop at Hill End in 1872.¹²

The secondary use of ship tanks as a convenient, strong and presumably readily available and cheap container (and a source of sheet iron) led to its spread across Australia, first as a cargo container for land transportation, and then in innumerable guises in thousands of country and city locations. A common picture is painted by Mary Durack, who recounted that the original droving party which established 'Fossil Downs' station, in the far north of Western Australia in 1883, carried two iron tanks full of biscuits, one of which was still in use as a water tank in a vegetable garden at 'Fossil Downs' in 1947 (and perhaps still is).¹³ Tanks on other properties were used as dog kennels, hot water heaters for showers at shearer's quarters (as at Mt Wood Station near Tibooburra), and very commonly as water tanks attached to homesteads and huts, and at other buildings such as country schools.¹⁴ As water containers, ship tanks were clearly ideally suited, this being after all one of the functions they were originally designed to fulfil. They were of a convenient size, light in weight, and able to be lined up in rows without loss of space. It is as water tanks that most ship tanks are seen in old photographs, and are recalled in the memories of country people.

Ship tanks were simply turned into tubs for heating water by cutting them in half. At Mt Wood Station near Tibooburra in the 1890s, two halves of a ship tank were used as hot-water wash tubs at the wool scours, while others were used for cold water storage for rinsing the fleeces. A similar use was shown in an 1895 photograph of the wool scour at Ollera, near Guyra on the New England Tablelands.¹⁵ Other common uses were as boilers for distilling eucalyptus oil, for which purpose the top was cut off and a close-fitting lid made to seal the boiler after it had been filled with leaves.¹⁶

Ship tanks were used in many guises in the maritime industries. A ship tank in the Queensland Museum's collection was used, cut in half, as a boiler for *bêche de mer* (trepang) on Lizard Island on the Great Barrier Reef. The half tank was used as an improvised boat by Mrs Watson, her child and a Chinese cook in a fatal attempt to escape the depredations of Aborigines in 1881. Ship tanks were used at the Davidson whaling station at Twofold Bay, and at other shore based whaling stations, as tanks in which whale oil was cooled.¹⁷ The finding of a ship tank lid, manufactured by John Bellamy, at Lusitania Bay on Macquarie Island, an Australian sub-Antarctic island, indicates the use of tanks for some as yet undetermined purpose (but possible for cooling or

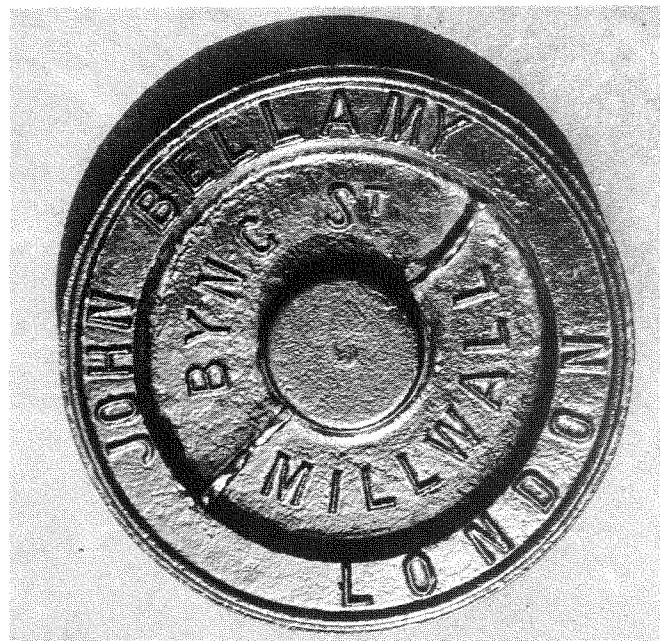


Fig. 3: Ship tank lid by the maker John Bellamy, who produced tanks from the 1860s to the 1930s. The central bung can be seen, in this case made of steel, and raised ribs instead of the more usual wire rods for turning the lid. Diameter of the lid 38.5 cm.

storage of penguin oil) at the penguin boiling-down station located there in the 1890s.¹⁸

Another Antarctic connection is an order for a specially made tank, which was very similar to a ship tank, that was placed by the Australian Antarctic explorer Douglas Mawson with the ship tank maker Bawn and Co. in London, for two tanks for use in his 1911-1914 Australasian Antarctic Expedition. The diagram attached to the order shows a tank 2 feet 6 inches x 2 feet 6 inches x 2ft 9in, with a round filling hole on top and a tap on one face.¹⁹

Ship tanks were widely employed on the mining fields of Australia. Photographs show them being used for water haulage on the Teetulpa goldfield in South Australia in 1886²⁰ and on the Western Australian Fields in 1895;²¹ as water condensers and storage tanks at Southern Cross goldfield in Western Australia (photo in Southern Cross Museum); used for explosive storage on a train on the Silverton to Broken Hill railway line (photo in Broken Hill Museum, and a similar example in Kapunda Museum, South Australia); and as water tanks for watering steam engines on the Newnes shale oil mine and refinery railway, and to provide water for the retorts at the Torbane shale oil refinery, in New South Wales.²² Peter Bell records a ship tank used for water storage at the 1870s Mabel Louise Mill in the Palmer River Goldfield in northern Queensland,²³ and two tanks can be seen in an 1870 photograph of the main street of the goldmining town of Ross in New Zealand.²⁴

Ship tanks were not only valuable as containers, but also as a source of sheet iron for other uses. Sheets obviously removed from a ship tank, still having rivet holes on the edges, have been seen by the author as fire-backs in mountain huts (Kosciusko, New South Wales), sheeting to hold back the earthen sides of limekilns (Goulburn, New South Wales), and as reinforcing at the top of mine shafts (Coolgardie, Western Australia). A photograph in the National Library of Australia collection shows a cooking hut built of ship tank sides on Moolooloo outstation at Victoria River Downs in the Northern Territory.²⁵ A similar re-use of containers as a source of sheet metal is seen in the many

uses of mild steel derived from kerosene drums and 44 gallon oil drums to be found throughout rural Australia.

As pointed out above, ship tanks themselves have no marks by which to identify the maker, but cast iron ship tank lids often do have the maker's name and address cast into them. Unfortunately surviving lids are far less numerous than the tanks themselves, presumably because the uses to which the tanks were put did not require the lid to be retained. Appendix 2 lists the name and location of labelled lids located to date by the author or reported by others in Australia. These include the London makers W. B. Bawn and Co., John Bellamy, Burney and Co., F. Braby and Co., Lancaster and Co., and Lancaster and Bawn, and one sole example of the Liverpool maker Wannop and Davies. Three tanks have been seen with an iron badge on the centre of the top edge of one face declaring that the tank was 'Made with Burney's Patent corners'.

CONCLUSION

The use of ship tanks in Australia over a long period and for so many uses is an interesting and little recognised example of the long persistence of re-use strategies in frontier societies. Manufactured products and materials were recycled whenever possible, because of the scarcity, cost and extended delivery time of purpose-made products. While the hoarding of defunct manufactured materials and the inventive use of 'make-do' self-sufficiency is sometimes portrayed in modern literature and film as a quaint 'Dad and Dave' style idiosyncrasy of 'backward' rural society, it is in fact a subsistence strategy which was an essential part of the settlement of Australia. It is interesting to speculate whether this re-use of available materials fostered a flexibility in thinking about immediate needs which lead to local inventions or to the modification of established equipment designs to meet local conditions and demands.

APPENDIX 1

LONDON SHIP TANK MANUFACTURERS

London Ship Tank manufacturers as listed in Kelly's Post Office Directories, searched at intervals between 1856 and 1940. The column 'Dates' gives the decades in which the makers name appears in the Directories as manufacturers of 'Ship Tanks'. Some makers continued production of 'iron tanks' of an unspecified nature, some of them beyond the 1940s, but these dates have not been included.

Ship Tank Manufacturer	Dates
Armstrong & Son	1920s
Atkins, Thomas & Son	1860s
Baldwins Ltd	1900s-1910s
Bawn, WB & Co.	1890s
Bellamy, John	1860s-1930s
Blackwall Galvanised Iron Co.	1890s-1900s
Braby, Frederick & Co.	1870s-1930s
Burney & Bellamy	1850s-1860s
Burney & Co. & Burney & Bellamy	1870s-1890s
Burney & Co.	1860s.
	1890s-1900s
Bury & Pollard	1860s
Campell Brothers	1850s
Camroux & Co.	1860s
Carr, Jas. W. & Co.	1920s
Cliff, Jas & Joseph	1860s
Cocks, D.J. & Co.	1860s
Cowan, Thomas & Wm.	1860s
Crouch & Jay	1870s
Davies James & Co.	1890s
Ewbank, Henry & Co.	1850s
Fletcher, Jennings & Co.	1870s
Frazer, John & Son	1850s-1860s
Gospel Oak Galvanising Co.	1890s-1910s
Harvey, G.A. & C.	1930s
Hipkins, Thos. & Edwin	1870s
Hodge, Samuel & Son	1850s-1870s
Jones, David	1870s
Lancaster & Bawn	1870s-1890s
Lancaster & Co.	1910s-1930s
Leaver & Shaw	1860s
Marshall, Alfred	1860s
McLaren, Peter & Walter	1860s
Melrose & Hussey	1850s
Nunn, William	1870s-1890s
Oliver, George & Joseph	1870s-1920s
Perseverance Co-Operative Boiler Making and Iron Ship Building Society (Ltd)	1870s
Porter, Jn, Henderson	1850s-1860s
Redpath & Leigh	1860s
Redpath & Paris	1870s-1890s
Robinson, John Webb & Son	1850s-1860s
Share George Wade & Co.	1890s
Shaw, Head & Co.	1870s
Simpson, F. & Co.	1860s
Skaife & Co.	1890s-1910s
Standing, Samuel	1850s
Standing, Wm.	1850s
Steel Barrel Co. Ltd	1910s-1930s
Steel Pipe Co. Ltd	1890s
Svendsen & Co.	1860s
Thames Iron Works & Ship Building Co.	1880s-1890s
Tildesley, Jesse	1870s
Tupper, Chas., Wm & Co.	1860s
Whitford, William & Co.	1870s-1880s
Winsor Engineering Co. Ltd	1920s

APPENDIX 2

MANUFACTURERS OF TANK LIDS FOUND IN AUSTRALIA

A list of the manufacturer's names on labelled lids located to date by the author or reported by others in Australia, and where they were located.

Tank Maker (as described on tank lids)	Location
W.B. Bawn & Co. Ltd, Byron Tank Works, Poplar London E.	<ul style="list-style-type: none"> • Mt Wood Station, Tibooburra, NSW • Broken Hill, NSW • Echuca , Victoria
John Bellamy, Byng St, Millwall, London	<ul style="list-style-type: none"> • Tumbarumba, NSW • Macquarie Island (1890s context) • Quarantine Station, Sydney, NSW (x2) • Willandra Station, NSW
F.Braby & Co., London	<ul style="list-style-type: none"> • Gulgong Museum, NSW • Peterborough, SA.
Burney & Co., Millwall Docks, London	<ul style="list-style-type: none"> • Mt Wood Station, Tibooburra, NSW • Tungkillo, SA • Kew, Vic. • Clermont Museum, Qld • Gulgong Museum, NSW • Kingsdale limekilns, Goulburn, NSW • Kapunda, SA
'Made with Burney's patent corners' (badge on body of tank)	
Lancaster & Co., Bow Tank Works, Bow London E.	<ul style="list-style-type: none"> • Coolgardie, WA • Gulgong Museum, NSW • Quarantine Station, Sydney, NSW (x2) • Blundells' Cottage, ACT
Lancaster & Bawn, Poplar London	• Bowral, NSW
Wannop & Davies, Liverpool	• Gulgong Museum, NSW

NOTES

1. Trevithick 1872: 285-286.
2. Dickinson and Titley 1934: 117-119.
3. Trevithick 1872: 288, 291-292.
4. Letter to author from Geoff Winter, Sydney Maritime Museum, 13/4/88.
5. Janes 1982: 363-264
6. Frederick Braby and Company (Limited) London, Liverpool, Glasgow, and Deptford, &c [catalogue no 9, London, 1883] : 134, quoted in Lewis 1990: 20.
7. Lewis 1990: 20.
8. Spillett 1972: 21
9. Spillett 1972: photograph p.44.
10. Newsletter of the Australian Association for Maritime History 1988, 34: 8 note 404. (henceforth AAMH)
11. Aplin & Storey 1984: 26
12. Holtermann Collection, Mitchell Library, Sydney: photo # 70088.
13. *Walkabout*, 14(4), Feb 1948, reported in Newsletter of AAMH, 1988, 33: 7 note 404.
14. Burnswoods and Fletcher 1980: photos 158, 162 and 198; Stokes 1983: 122; Gilbert 1980: photo 52.
15. Pearson 1984; Gilbert 1980: 124
16. Penfold & Morrison 1952: 12
17. Pearson 1983: 48
18. Townrow 1989: 97
19. Letter from D. Mawson to Bawn and Co, West India Dock Road, Poplar E., July 7, 1911. Mawson Institute Collection, AAE/3/Box 4/Loc 2.
20. Stone 1974:160.
21. Sligo 1980:154.
22. Eardley & Stephens 1974: 107, 127, 147.
23. Bell 1987:65.
24. Nolan 1975:71.
25. Coupe 1989: 260.

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