

## Bristol's other Iron Ship Steam Tug 'Mayflower'

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Eighteen years after the *SS Great Britain* squeezed out of her dry dock, a steam tug named *Mayflower* was launched from the shipyard on the opposite bank of the City Docks. One hundred and twenty years later, she returned to Bristol to be preserved by the City Museum and Art Gallery, at the Industrial Museum. Her history is no less exciting (although perhaps less spectacular) than that of her better-known neighbour.

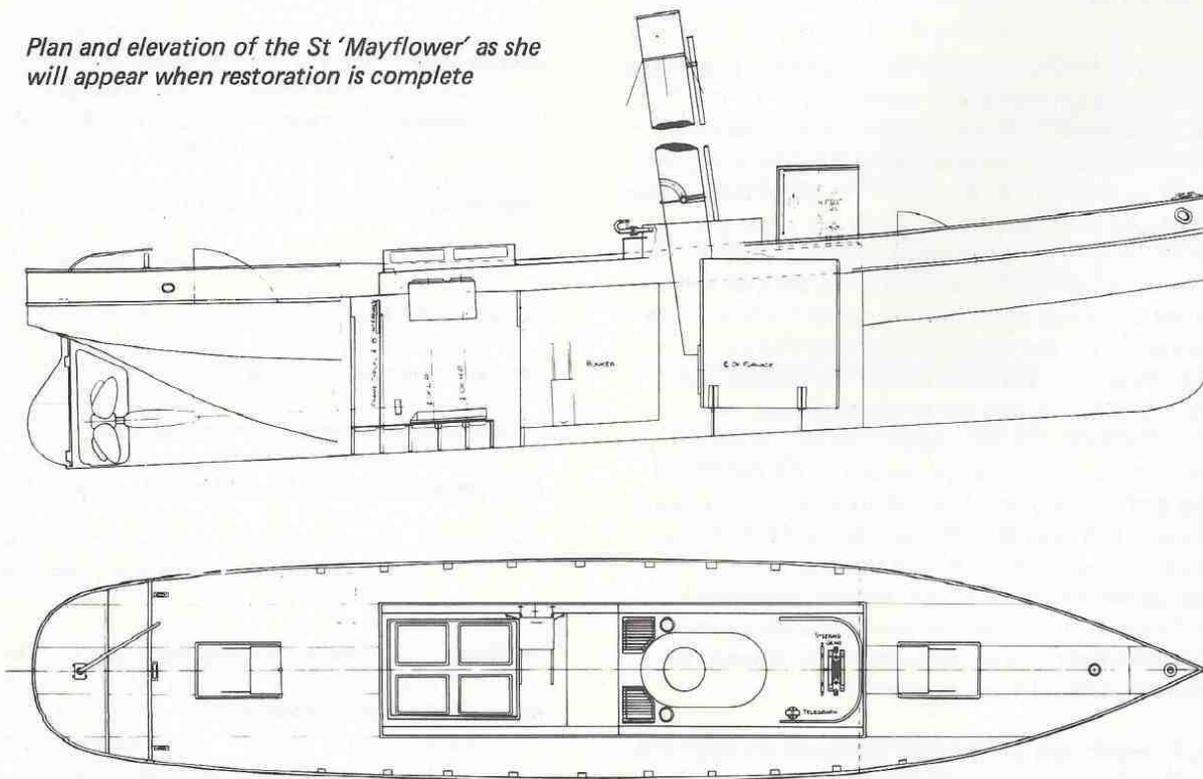
The Company which built *Mayflower* had its roots in the Bath-based company of Stothert (later to become Stothert & Pitt)<sup>1</sup>. In 1837, Stotherts bought land at St Philips in Bristol to build a foundry and factory to produce railway locomotives and general ironwork. The company grew to become the well-known Avonside Engine Company in 1864, although Stothert family involvement had ended by that time. As well as locomotives, the company produced stationary steam engines (including beam engines for Deptford Pumping Station, amongst others), marine engines of several types, boilers and, from 1844, steam ships.

That the first two vessels built should be iron screw steamers is no surprise; Edward Slaughter, a partner in the firm, had worked with I K Brunel as an engineer on the GWR, and it

seems reasonable to assume that Slaughter's connections with Brunel led to Stothert, Slaughter and Company (as the firm was now known) supplying parts for the *Great Britain*. *Avon* and *Severn* were built at St Philips with locomotive-type engines, and worked on the Newport-Bristol packet route. They quickly proved the advantage of screws over paddles.

In 1852, the shipbuilding side of the business moved to a yard at Hotwells<sup>2</sup>. Several large vessels (between 780 and 1156 tons) were built here, including the *Scamander*, *Meander* and *Araxes*, all powered by different types of Stothert-built marine engines; all were described in the engineering magazine *Artizan*, and Stotherts later named a ship after the journal<sup>3</sup>. By the time these vessels were constructed, the shipbuilding section of the company had separated from the parent, and was now under the management of George Kelson Stothert, a remarkable marine engineer and pioneer of iron shipbuilding who was elected to the Royal Institution of Naval Architects at 29 years of age. In partnership with Fripp (1855 - 1859), Marten (1859 - 1866) and after this, alone, G K remained at the helm until 1899, when he retired. The company retained his name until it closed in 1933<sup>4</sup>, although there

Plan and elevation of the St 'Mayflower' as she will appear when restoration is complete



was no Stothert involvement after G K's death in 1908. Indeed, the company ceased shipbuilding in 1904, continuing as repairers, boiler makers and engineers.

In many ways, G K Stothert and Company and its predecessors deserve rather more attention than they tend to receive, usually being ignored in Bristol histories in favour of the longer-lived, but essentially traditional Charles Hill and Son Ltd.<sup>3</sup> Stothert's were the only Bristol-based company who represented that new generation of engineer-shipbuilders working entirely in iron, which appeared in the 1840s following Brunel's success with the Great Britain.

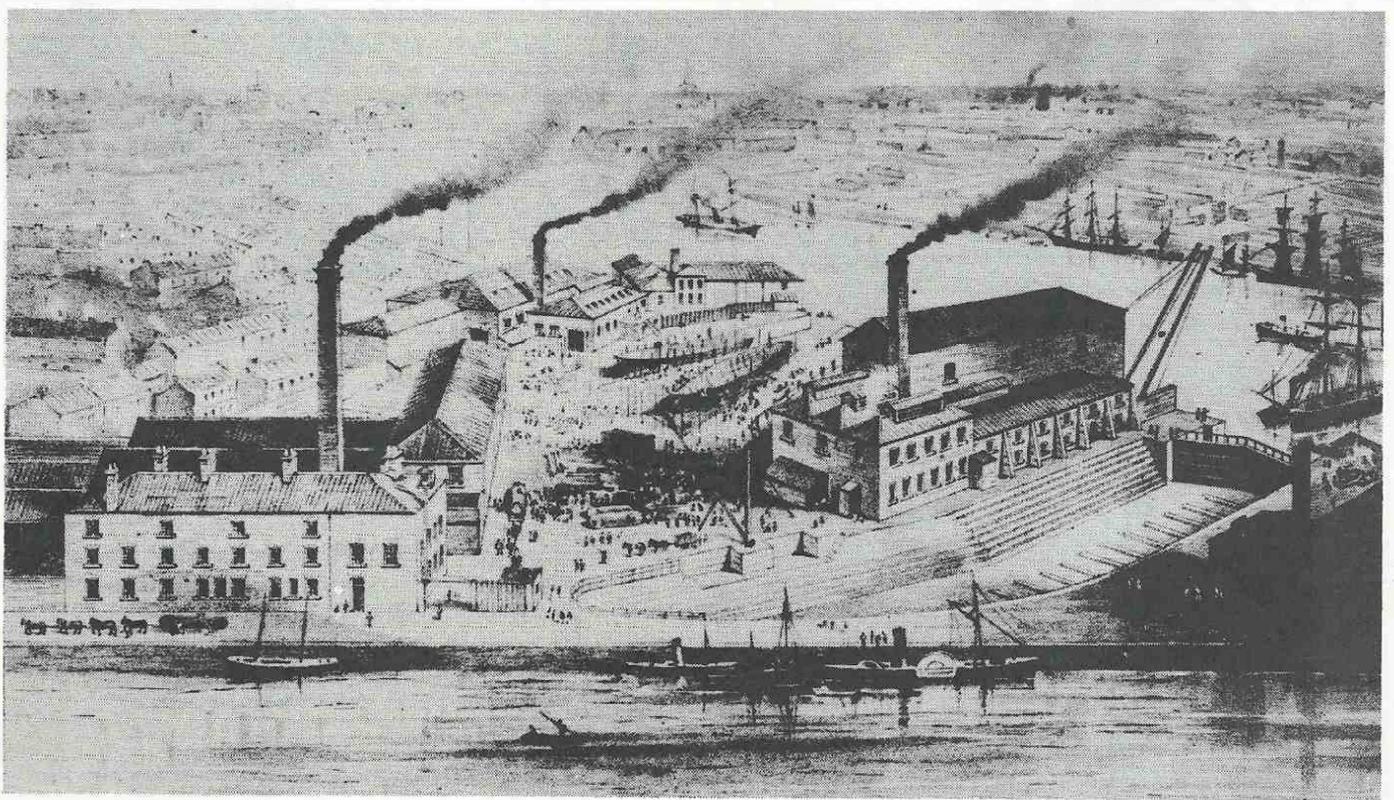
In 1859 the Gloucester & Berkeley Canal Company decided to hire a steam tug from J W Hyde & Company of Bristol, for a one month trial<sup>6</sup>. The tug *Reindeer*, duly arrived and started work on 11th November. By 7th December, *Reindeer* had already shown herself to be 25% more efficient than the tow-horses used hitherto, and two weeks later, Timothy Hadley<sup>7</sup>, the towage contractor for the canal, was asked to provide two tugs. By July 1860, the first was in operation; this was the *Moss Rose*, built by Stothert & Marten, and she was followed in May 1861 by her sister ship *Mayflower*.<sup>8</sup>

*Mayflower's* launch on 18th May 1861, is commemorated in a column inch of the *Western Daily Press* (20th May 1861). Her original size and equipment is recorded in a report to the Institution of Civil Engineers in 1866<sup>9</sup>. The author describes *Mayflower* and *Moss Rose*:

They are iron boats . . . 65 feet long<sup>10</sup> each, 12 feet beam and drawing 6 feet 3 inches of water, fitted with high pressure engines, the diameters of the cylinders being 20 inches with a length of stroke 18 inches, the pressure of the steam being 32 lbs on the inch. The screws have three blades, 5 feet diameter and 6½ feet pitch.

The total cost of these and another tug<sup>11</sup> was £3,000. Two men and a boy were employed on each vessel, and the tugs used between 15 and 20 cwt of coal every twelve working hours. The author goes into great detail about the working advantages of the tugs, which may be summed up thus: overall the tugs saved about 65% on the cost of haulage by horses; wear on tow ropes and tow paths was reduced, speed was increased and towage was able to continue in weather too adverse for horses; damage to the sixteen bridges on the canal dropped by a half. The one disadvantage was increased damage to the canal banks, but even this was offset to some extent by easier dredging, caused by the scouring action of faster-moving ships shifting the mud into the centre of the canal.

In 1874, the tugs then at work on the canal were purchased by the Company.<sup>12</sup> *Mayflower* was working between Gloucester and Sharpness at this time, and apparently working as far as Avonmouth on occasion. This work was obviously beginning to tell on her, as at some point a new crankshaft was installed.<sup>13</sup> By 1899, she needed a new engine; this engine is still in her. An inverted vertical compound marine engine with integral surface condenser, it was built by W Sisson & Company, Gloucester. The



*The Hotwells works of G K Stothert and Company, c1890.*

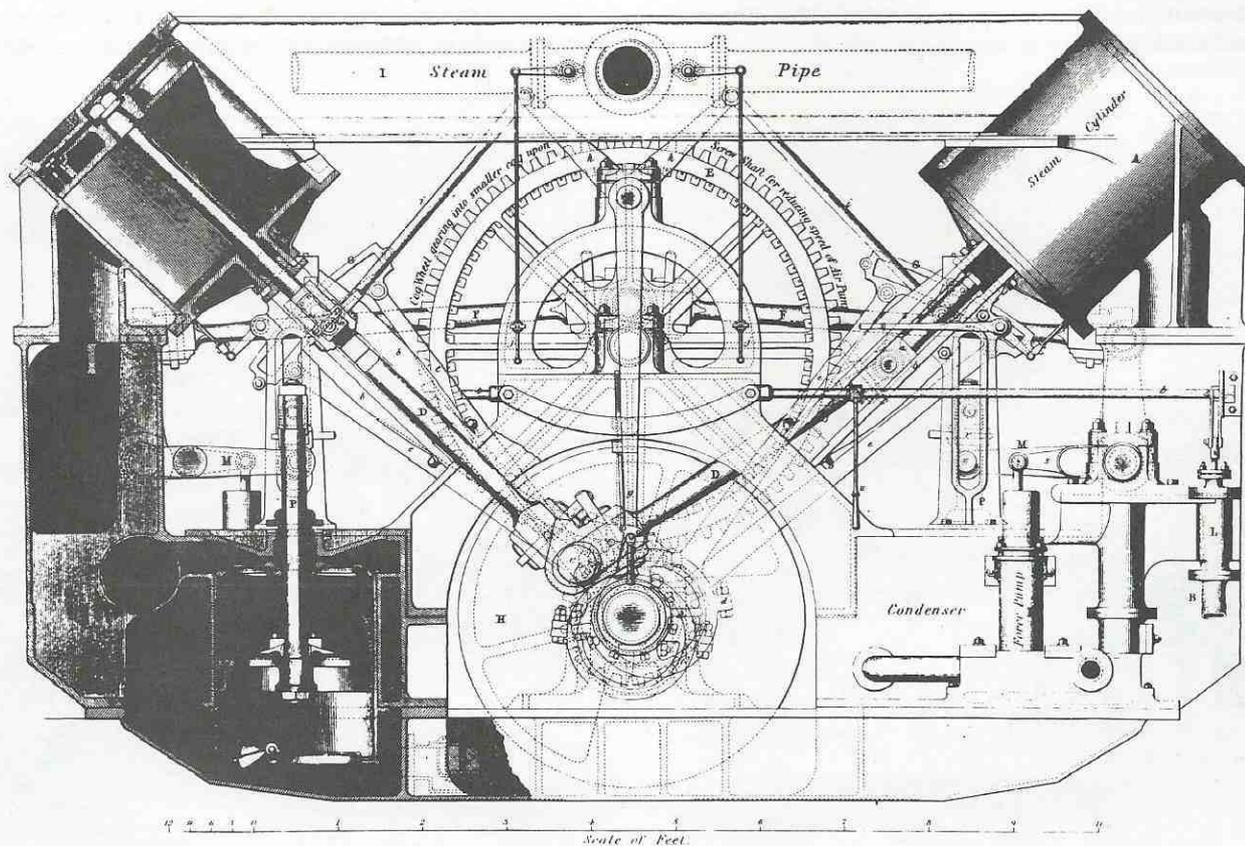
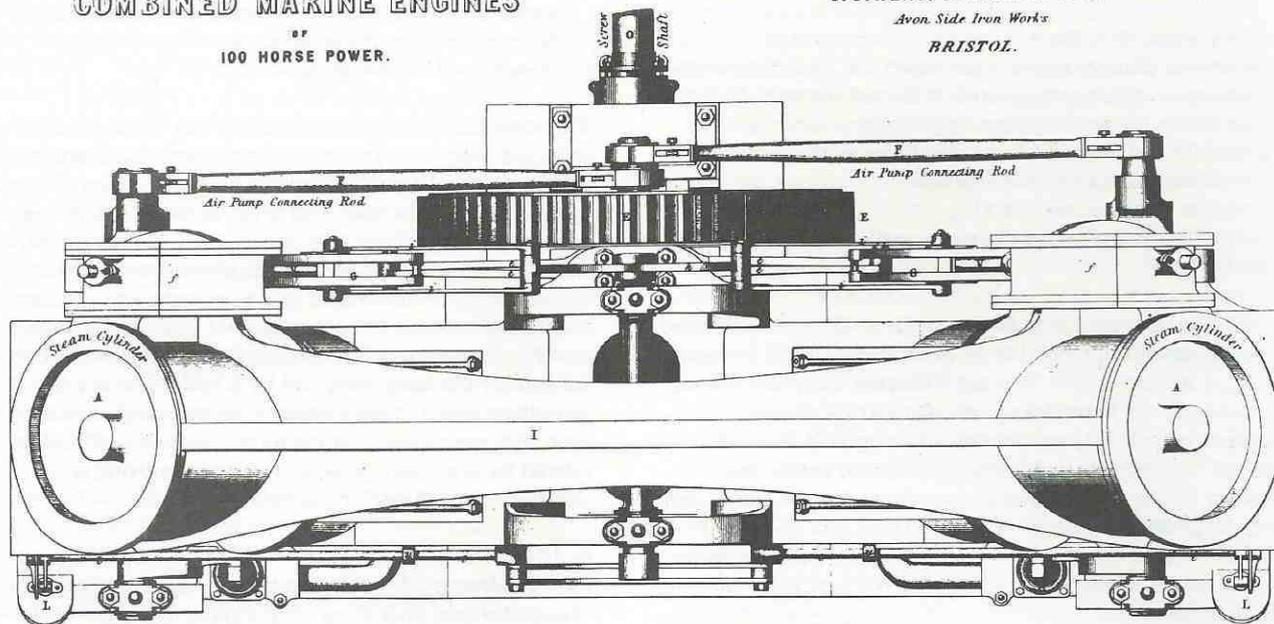
COMBINED MARINE ENGINES

OF  
100 HORSE POWER.

STOTHERT, SLAUGHTER & CO

Avon Side Iron Works

BRISTOL.



Patent drawing of the type of engine originally fitted in 'Mayflower' (see note 13).

cylinders are 12ins and 20ins bore by 16ins stroke. The reversing gear is Sisson's patent (No 3634-1885) type, with no eccentrics, similar in principle to Joy's valve gear, but with five links instead of three. The engine is said to have been rated at 15nhp, 120ihp. An interesting feature of the engine is the high-pressure valve; this began life as a slide valve, but was converted to a piston valve at a later date, using a casting bolted across the valve ports. The engine serial number is 555.<sup>14</sup>

The replacement of the engine was only the first in a long series of alterations made to *Mayflower*. In 1904 she entered dry dock in Gloucester and was stripped to her frames for replating. She remained in this dock for five years, the dock being flooded around her when it was required for other work. It would seem that the work was delayed, as a boiler built by W Sisson & Company for *Mayflower* in the 1890s eventually found its way into *Hazel*, another tug on the canal.<sup>15</sup> A new boiler was installed in 1909; a Scotch two-flue marine boiler, coal-fired and made by G K Stothert & Company, Bristol. This boiler remains in the tug.

In 1922, *Mayflower's* working life was again interrupted. Her area of work was changed to the River Severn upstream of Gloucester to Stourport and Worcester, and more alterations were made to her hull to better suit her to this part of the navigation. The entire deck was raised 12 inches and the bulwarks were cut away along most of each side, allowing the deck to be open and at the same level with the riverside wharves. The boiler casing and other superstructure was altered and the funnel was made to hinge at the base, to allow easy passage under the low bridges. Larger counterweights were hung rigidly on either side of the funnel to ease the job of lowering and raising, but old crew members recall these huge lumps of cast iron as 'a bloody nuisance', obstructing the already narrow decks. The funnel was only 15ins too high for the lowest bridge, and it was not many years before the top was trimmed to avoid this operation. The weights remained, however, and the hinging funnel will be a feature of the restored tug.<sup>16</sup>

Elsewhere on deck, other changes were made. The swan-neck davit and anchor winch originally fitted in the bows to raise the drag anchor, were removed; the anchor was only of use in the river estuary. The towing hook behind the funnel was augmented by another, for barges, just aft of the engine-room skylight. A new entrance was made to the engine room itself; previously, access had been down a ladder through the skylight.

Below decks the accommodation was refitted, with wood panelling over the sides painted and scumbled to resemble wood grain, even on those metal plates left bare. In the bows, just aft of the chain locker, was the forepeak cabin, with a stove, two benches and a table. This was used by the skipper during the 1930s, but after the Second World War, a toilet was built in at the forward end (before this, the crew had 'gone in the coal'). The major part of the hull midships was occupied by the engine and boiler, with coal bunkers either side of the room. Communications between the engineer and helmsman was by an engine room telegraph (made by Chadburn of Liverpool) and a make-shift speaking tube. In the stern another cabin occupied the space above the propeller shaft; until the deck was raised, this would have been stowage for gear, but now a full cooking range was installed along the engine-room

bulkhead, together with bunks and cupboards.

By the late 1930s, the bulwarks had been replaced, and *Mayflower* was carrying out less arduous duties. She spent most of the period towing barges and it was while so engaged that she acquired the dent and twist in her stem. It was common practice for the skipper to ring down for full ahead about 300 yards before Llanthony Bridge in Gloucester, to put on enough way for the train of barges to drift into the Docks without the tug. At the right moment, the engine would be thrown full astern, and the tug would stop short of the dock wall. Unfortunately, on one occasion this failed to work, as the stem bears testimony to this day.<sup>17</sup>

While spending most of the Second World War as workboat for the canal dredger, *Mayflower* was altered in appearance yet again, when a wooden wheelhouse replaced the iron steering shelter used hitherto (the shelter has now been replaced). This was the first time that the helmsman had any real protection from the elements. In 1948, the British Transport Commission (later the British Waterways Board) took control of the canal, and efforts were made to modernise the elderly tug fleet. *Mayflower* was the oldest tug in service by some sixteen years<sup>18</sup> so that when the other tugs were converted to diesel engines, she was merely overhauled. Soon afterwards, in 1953, *Mayflower* was laid up, and the newly-motorised tugs continued alone. In 1963 however, the very severe winter froze the fuel lines on the diesel tugs, and *Mayflower*, the only vessel able to work, was pressed back into service.

This last brief starring role ended her working life and she was sold as scrap in 1964. By a curious quirk of fate, she survived the attentions of vandals and a succession of scrap dealers almost intact for the next fifteen years. She was purchased by Bristol Museum and Art Gallery in April 1981, with the help of a grant from the Science Museum, London, and was towed back to Bristol in October the same year. She is now the oldest surviving Bristol-built ship still afloat, and the only Stothert-built vessel largely unaltered in appearance<sup>19</sup>. Her restoration to working order with the general look of a nineteenth-century tug will make *Mayflower* the oldest surviving vessel of her type in the world, and an admirable counterpoint to the *SS Great Britain*.

## References and Notes

- 1 Details of the early history of Stothert, Slaughter & Co. Stothert & Fripp, Stothert & Marten and G K Stothert & Co are extracted from **The Evolution of a Family Firm: Stothert & Pitt of Bath** by Dr H S Torrens (Stothert & Pitt Ltd, 1978) and from research undertaken voluntarily for the Museum by David Martell; David's research work has made this article possible, and the Museum is very grateful for his efforts.
- 2 Part of the yard can still be seen, although the area is now occupied by the Merchants Dock housing development and the sand yards; the dock now used by the dredgers was once Stothert's graving dock. The site had been used by James Hilhouse (predecessor of Charles Hill) (1772-1823), the Steam Packet Co (1827-1834) and George Lunnell (1834-1851).

- 3 **The Artizan**, 1st June 1858, 'Engines of screw steam ships *Scamander*, *Meander* and *Araxes*'; and **The Artizan**, 1st March 1859, 'The *Artizan* steam ship'.
- 4 At the auction of the company's holdings in 1933, the City Museum acquired 29 half-hull block models of Stothert's ships, including one which is possibly *Mayflower*. A few prints and documents were also bought.
- 5 Charles Hill & Sons Ltd did not equip for iron ship-building until 1880, and then quickly went over to steel.
- 6 Public Records Office documents PRO/Rail 809 Vol 12, pp 218-336, and Vol 13, pp 30-43, contain these and other details.
- 7 Timothy Hadley (b 31st May 1818, d 9th July 1884), was listed as 'Farmer, miller, timber merchant and steam tug boat proprietor of Pocketon Farm and Purton steam flour and saw mills' in the **Commercial Directories** of **1865** and **1867**. The mills were situated just to the left of Lower Bridge on the church side of the canal, and burned down in the 1930s. Hadley is listed in the 1861 census as a farmer of two hundred acres and contractor employing seventeen labourers and three boys. He was towage contractor between **1858** and **1874**, when the company took over.
- 8 There followed a series of tugs named after wild flowers: *Violet* (1862 possibly Stothert & Marten); *Mistletoe* (details unknown, but possibly Stothert c 1867); *Myrtle* (1867, Stothert); *Hazel* (1871, possibly Stothert); *Speedwell* (1876, Stothert); *Resolute* (1897, Stothert, a name strangely out of sequence); *Iris* (1905, Cox & Co, Falmouth); and *Primrose* (1906, Robert Cock & Sons, Appledore).
- 9 'Results of the Employment of Steam Power in Towing Vessels on the Gloucester and Berkeley Canal' by W B Clegram, MInstCE, in **Proceedings of the Institution of Civil Engineers**, No 1154, 13th November 1866.
- 10 *Mayflower* is actually 63ft 6ins, but she may have been shortened later in her career. She had a gross tonnage of 32 tons when she was registered as No 105412 in 1902.
- 11 Possibly *Violet*; if so, she was 55ft long, 9ft 6ins beam and 5ft draught, with a single cylinder engine 16 inches bore x 18 inches stroke, working at 25 psi.
- 12 This was the year in which Sharpness Docks were completed. The company, having bought part of the Birmingham Navigation Canal at the same time, carried out a consolidation exercise and renamed itself with the unwieldy title Sharpness New Docks and Gloucester & Birmingham Navigation Company.
- 13 An undated pencil drawing survives at Gloucester County Records Office (No 24-G-2). It confirms that the original engine, as described earlier, was a Stothert-built 'V'-twin condensing engine, with the air pump speed reduced by gearing. This type of engine was patented by Edward Slaughter in 1849 (No 12433) and was exhibited by Stothert Slaughter & Co at the Great Exhibition in 1851.
- 14 Plans of the engine and seatings at Gloucester County Records Office (Nos 24-G-3 and 24-G-5).
- 15 Plans of this boiler at Gloucester County Record Office (No 24-G-4).
- 16 Details of alterations on plan at Gloucester County Records Office (No 24-G-1).
- 17 A tale recounted by Mr Alf Thomas, formerly employed on tugs by the Gloucester-based Severn & Canal Carrying Company.
- 18 *Moss Rose* and *Myrtle* were scrapped about 1930. *Violet* and *Mistletoe* had also disappeared, and *Hazel* had been sold as a pleasure boat. The next eldest was *Speedwell*, and she too was sold to scrap in 1961.
- 19 *Resolute*, built by Stothert in 1897, served with *Mayflower* on the canal until sold to F A Ashmead in Bristol in 1970. She was renamed *Thelm Leigh*, but sold in 1978 to F C Larkham of Westbury-on-Severn, where she was again renamed, this time *Resolute Lady*. She is believed to be still in service, having been converted to diesel in 1950 and otherwise greatly altered in appearance.

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Bristol Museum and Art Gallery would like to thank all the volunteers who have been involved in the restoration work so far. Thanks are especially due to Andrew Hall for the production of the line drawing of *Mayflower* which appears at the start of this article. We would also like to acknowledge the generosity of JFH Plant Hire who have made compressed air plant available to us free of charge throughout the project. Offers of help are always welcome. Please contact Andy King at the Industrial Museum (Bristol 299771) for further information.