



Canal &
River Trust

Keeping people, nature & history connected

Bingley Five Rise Locks

On the Leeds & Liverpool Canal



www.canalrivertrust.org.uk



Engineering Challenges & Solutions

The canal engineers used the latest techniques to overcome the challenges of the landscape.

There are 92 locks along the Leeds & Liverpool Canal, most of which are grouped together. The canal engineers also tried to avoid expensive tunnels and cutting which means the canals winds its way round hills.

The canal is unique in having many staircase locks which help the canal to climb more than 148 metres (487 feet) up the Pennines and down the other side.

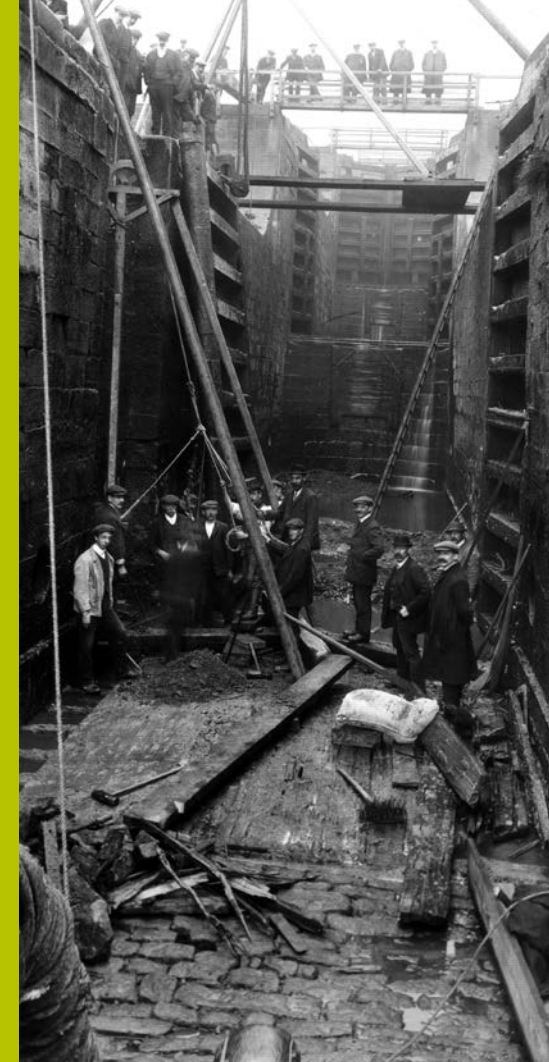
Between Bingley and Leeds there are three sets of two rise locks; four sets of three rise locks and the famous Bingley Five Rise Locks.

Bingley Five Rise Staircase Locks

One of the 'Seven Wonders of the Waterways' Bingley Five Rise Locks are an awesome feat of engineering raising the canal 18 metres (60 feet).

The Five Rise and Three Rise Locks were designed by John Longbotham of Halifax who was the Leeds & Liverpool Canal's first engineer.

They have changed little since they were first built in the 1770s. The gracefully curved buttresses were designed to make it easier for the horses to manoeuvre boats through the locks.



above: Workmen replace the wooden floor of the lock chamber in 1912.

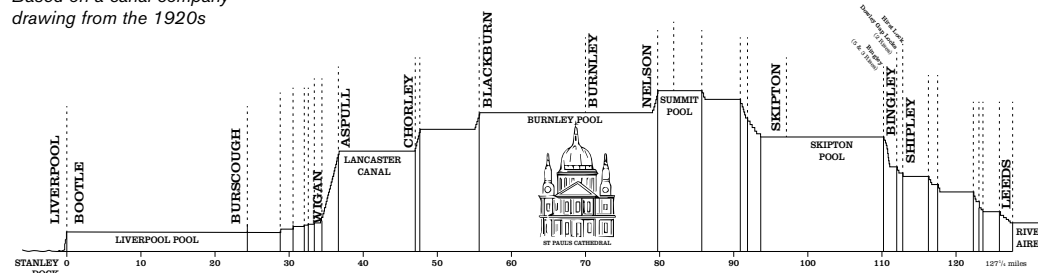
left: 10,000 people turned out for the 200th anniversary celebrations in 1974.

The locks opened on 21 March 1774 with the ringing of church bells, the firing of guns and shouts of joy.

Replacing the tallest lock gates in the country at Bingley Five Rise Locks in 2012.

Up one side and down the other

Based on a canal company drawing from the 1920s



The Leeds & Liverpool Canal

Connecting Communities

The Leeds & Liverpool Canal is the longest canal in Britain with a main line of just over 127 miles linking ports on the east and west coasts.

It is a broad canal and took over 40 years to complete. Work began at both ends simultaneously and by 1777 the canal

was open from Liverpool to Wigan and from Leeds to Gargrave. But it was not until 1816 that the cities of Leeds and Liverpool were finally connected.

The canal cost around a quarter of a million pounds to build, which is the equivalent of around £8 million today.

Few canals carried

such a range of goods

The canal runs through some of the most heavily populated parts of the country and the towns along its route are famous for textile making.

The stretch between Bingley and Saltaire has many worsted mills along its length. These spun and twisted a wide range of long fibres to form a tough but lightweight cloth widely used for suiting and uniforms.

Coal was the main cargo providing power for the worsted mills, for gasworks and for domestic use; limestone was transported from the Craven district and there were many lime kilns and coal wharves along the length of the canal.



Horse drawn canal company short boat Tiger around 1900.

International cargo included: wool from Australia; mohair and alpaca fleeces from South America; silk from China; wheat from the USA; cocoa from West Africa and molasses from the Caribbean.

For 178 years the canal was owned by a private canal company. In 1948 it transferred to British Waterways which in 2012 became the Canal & River Trust.



The Maintenance Team

The locks and canal have to be regularly maintained to prevent loss of water and lock gates are usually replaced every 25 years.

In the photo above the workmen have been carrying out repairs to the wooden sill at the bottom of the lock gate to create a watertight seal. At this time the gates were made a few miles down the canal at the Apperley Bridge workshop.

“I joined the engineering department of the Leeds & Liverpool Canal Company in September 1914, only a month after the start of the First World War. Things were Victorian, or certainly Edwardian... with very many old fashioned methods still in use. Men dressed in old swallow tail coats that had been Sunday best in previous years. Some of them even had old bowler hats at work, they were a quaint gang.”

Will Hodgson

above: Foreman D. W. Turner in bowler hat and his maintenance team pose for the camera at the top of Bingley Five Rise Locks in 1912.



Cutting off the gearing to make the gate lighter to lift.



Visitors during an open weekend in 2012.



Caring for the Locks

100 years ago the maintenance team used just an A-frame, block & tackle to lift the five ton lock gates into position. Today they are lifted into position using a hydraulic crane.

Although the equipment and Health & Safety rules have changed they still use traditional skills to fit the heavy wooden gates.

They still have to be carefully hand-fitted on site by skilled carpenters, just as they would have done in 1912.

Today the lock gates are made at Stanley Ferry, near Wakefield, one of only two specialist lock gate making workshops in the country.

In January 2012 four gates in the Five Rise Locks were replaced.

More than 7,000 visitors were guided through the empty lock chamber over an open weekend.

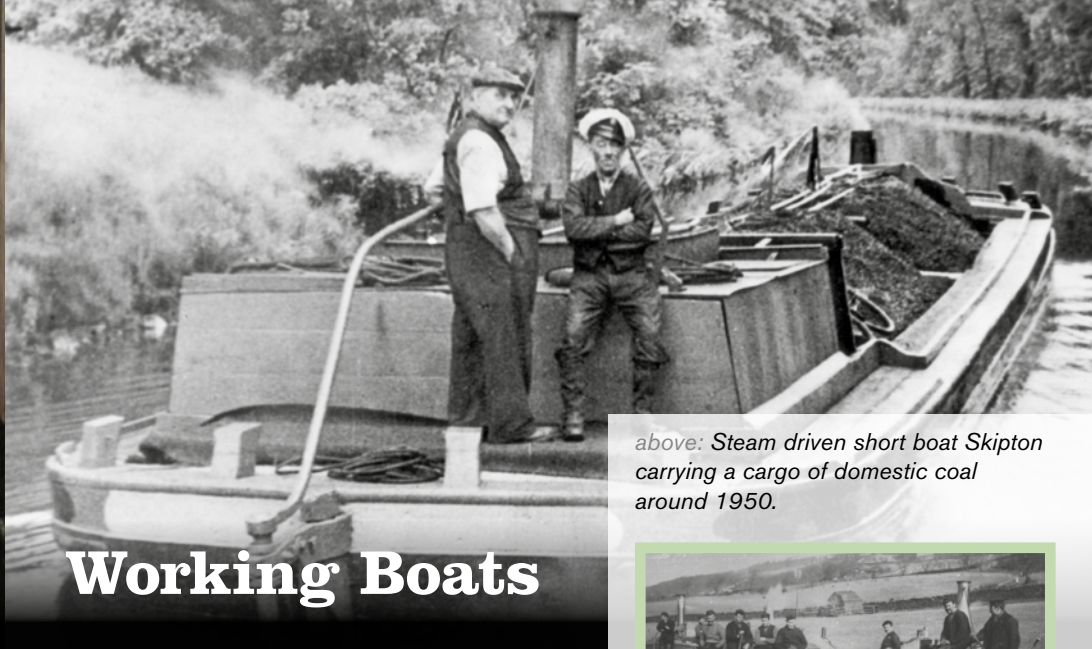
above: Project Manager Peter Carter in the middle wearing yellow jacket and his team of carpenters at Bingley Five Rise Locks 2012.



New lock gate being lifted into position at Five Rise Locks around 1900.

“It's hard work for us, with modern equipment... how they did it with just block & tackle and wooden A-frames and muscle power is simply astounding.”

Peter Carter



above: Steam driven short boat Skipton carrying a cargo of domestic coal around 1950.

Working Boats

100 years ago there were more than a thousand boats working on the Leeds & Liverpool Canal.

The traditional Leeds & Liverpool Canal short boat was shorter and wider than the widely used narrowboats.

The short boat was based on coastal sailing craft and took its colourful decorative style known as Brightwork from them.

The boats were hauled by horses although steam powered boats were introduced in 1858. Steam boats became widely used within 20 years. Diesel engines were introduced for commercial use in 1920.

Despite the introduction of engines, horses continued to be used for haulage throughout the working life of the canal. The last horse-drawn working boat stopped in 1961.



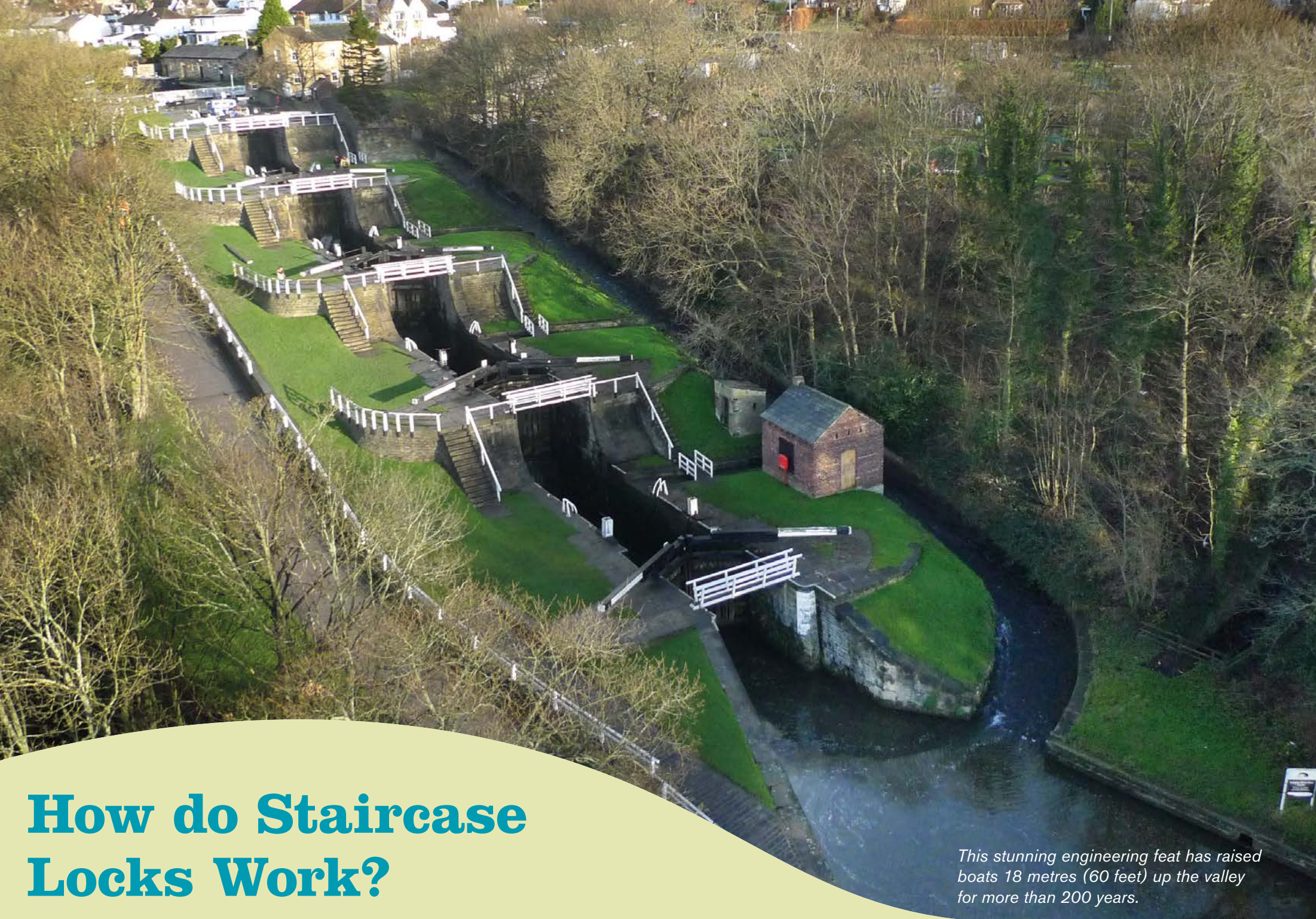
Steam flyboats Agate, Amy & Beaver ice bound at the top of Five Rise Locks around 1915.



Traditional short boat Edith at the bottom of Five Rise Locks.



Canal company launch Alexandra with company directors above Five Rise Locks.



This stunning engineering feat has raised boats 18 metres (60 feet) up the valley for more than 200 years.



Boat horse Bilbo Baggins pulls a narrowboat past the old stables.



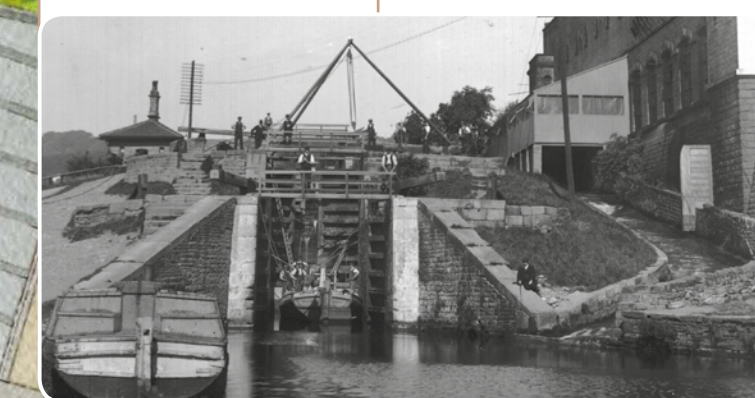
Barry Whitelock



Will Hodgson



Three Rise Lock Keeper's Cottage demolished around 1956.



Bingley Three Rise Locks around 1920.

Canal Stables

Canal boats were originally pulled by horses and the canal company provided a large stable at Five Rise Locks to service the fast flyboats. They needed a regular change of horses.

The stables are now a cafe. Just inside the entrance you can see part of a wooden stable partition or 'stall' which has been moved there.

The modern doors and windows mark the position of the original stable doors.

The Lock Keeper

The locks are operated by a lock keeper to ensure safety and conserve water.

Barry Whitelock has been lock keeper at Five Rise Locks since 1978. He is the country's longest serving lock keeper. He used to watch the old lock keeper Eddie Murgatroyd every weekend from the age of 8 and finally took over from him when he was 19.

From his small office, at the top of the Five Rise Locks Barry controls the flow of water. He regulates 10 million gallons of water a day between Bingley and Leeds.

The Carpenter's Shop

This old picture from around 1890 shows the old carpenter's workshop to the left of the locks.

It is long gone. The small crane was used to lift timber and finished bridges onto the boats. Will Hodgson the carpenter worked here. He joined the canal company as a boy apprentice in 1914.

He worked for 51 years retiring in 1965. He used to repair the lock gates and make swing bridges. The small brick building on the other side was the forge, where they made and repaired all the iron fittings.

I remember the lovely smell of the fresh sawdust, it brings it all back... one day there was a bird nesting next to the piece of wood they were going to use to repair the lock gates, they had to put off repairing the lock gates or choose another piece of wood!

Jean Jones, daughter of Will Hodgson

Three Rise Locks

The Three Rise Locks were built in 1774 at the same time as the Five Rise Locks. In the photo on the left, the lock gates are being replaced.

They are using a simple A-frame and block & tackle to lift the heavy gates.

You can just glimpse the lock keeper's cottage at the top left of the locks. It is a typical Leeds & Liverpool Canal cottage.

The partially demolished back wall of the cottage is built into the boundary wall between the allotments and the canal. If you look over the back of it you will see the remains of two window cills.

How do Staircase Locks Work?

Staircase locks are two or more locks joined together so that the bottom gates of one lock are the top gates of the next.

Locks

A lock is simply a chamber holding water with gates at each end.

By emptying or filling the chamber the boat can go up or down hill.

All the locks in the staircase need to be prepared by the lock keeper before the boat goes through.

The boat enters the lock when the water level inside is the same as that outside the lock.

Lock Gates

Lock gates are watertight doors which seal off each chamber. When closed they meet at an angle facing upstream.

The lock gates are opened and closed by pushing the balance beams.

Stone setts (heel grips) are set into the ground beneath the balance beams to allow better grip.

With the lock gates closed the water level is adjusted using the lock paddles.

Lock Paddles

Locks paddles are like giant taps, you open them to let water flow in or out of the lock chamber.

Water from the upper lock fills the lock below through the lock gate paddles, and via short tunnels (culverts) in the wall.

The flow of water through the culverts is controlled by the ground box paddle.

The gate paddle (gate sluice) is operated using a removable winding handle known as a windlass.

Lock Paddles



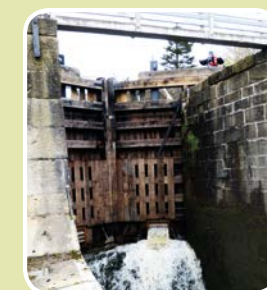
Ground paddle



Ground paddle / tunnel (culvert)

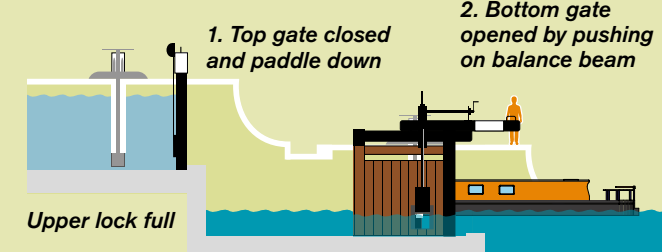


Removable windlass

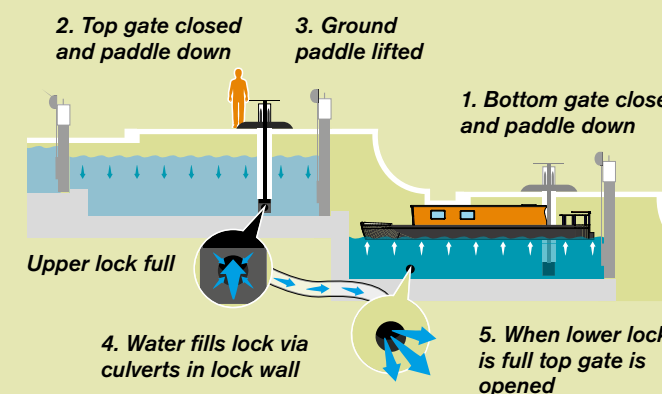


Gate paddle (gate sluice)

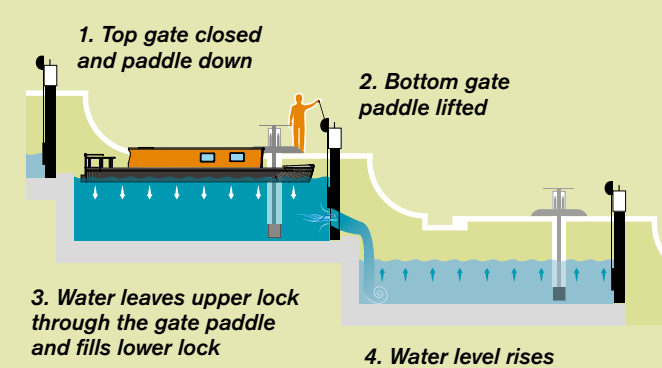
Boat Going Up Entering Lock



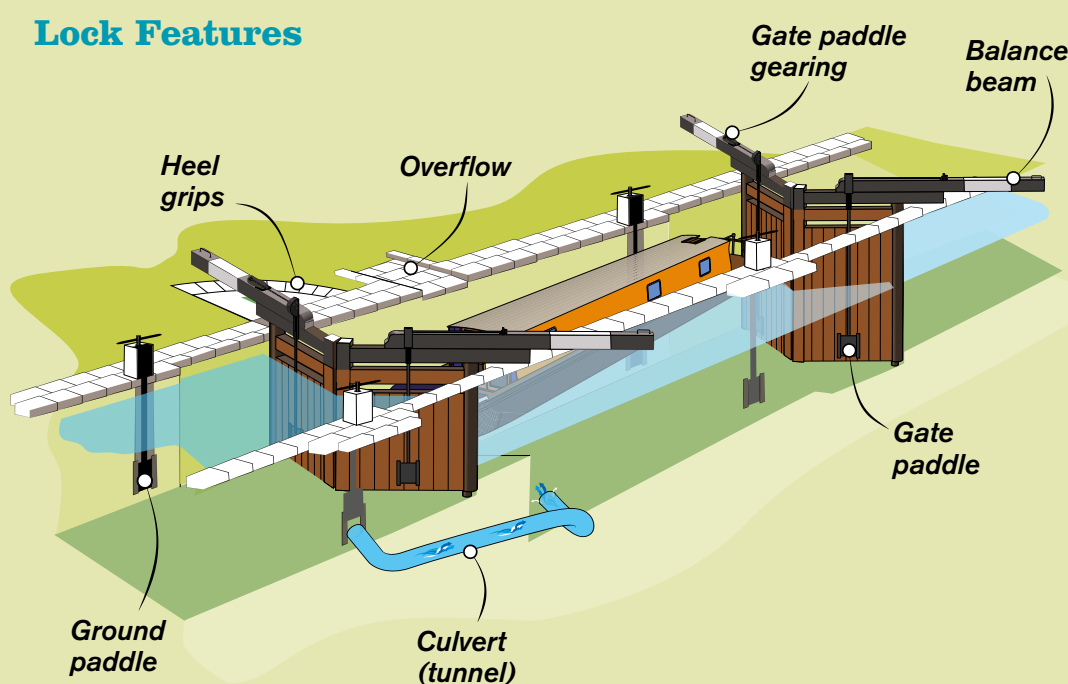
Boat Going Up Lock Filling



Boat Going Down Lock Emptying



Lock Features



Join us as an Education Volunteer.

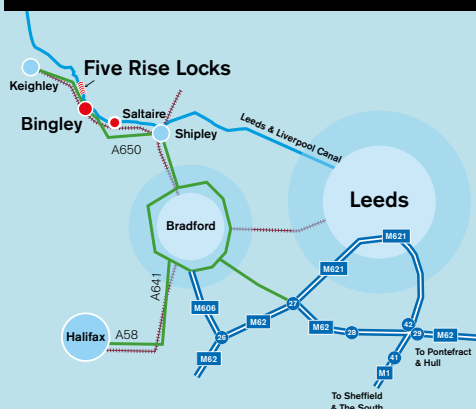
We are looking for volunteers who love working with children and would like to encourage them to explore the Leeds & Liverpool Canal in schools, on the towpath, through our website and at waterside events.

To find out more...

Contact our education volunteer coordinator:

Sarah Cook T: 07715 377 788 E: sarah.cook@canalrivertrust.org.uk

www.canalriverexplorers.org.uk



Other Ways to Enjoy the Locks

Explore our family geocaching trail around the North Bog and for the more experienced a geocaching trail along the towpath between Bingley and Saltaire.

Discover the QR code plaques down the towpath between Micklethwaite and Saltaire to see links to video and audio.

Download education resources from www.canalriverexplorers.org.uk or explore our box of treasures in the café.

How to Get Here Bingley is on the A650 between Bradford and Keighley and there is access to the towpath at Bingley Railway Station.



Support us! To find out how you can support the Canal & River Trust visit www.canalrivertrust.org.uk

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E customer.services@canalrivertrust.org.uk



Scan the QR code to download the Bingley Five Rise App packed full of stories, video and photos of the locks and canal between Bingley and Saltaire or visit www.canalrivertrust.org.uk/bingley

Download a FREE QR code reader from the APP Store or Google Play.



The Interreg IVB
North Sea Region
Programme



Waterways for Growth

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