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## LEAD MINING WITH STEAM IN THE CRAVEN DALES

J.M. Dickinson

It is perhaps not generally realized that steam was used more widely as a source of power in the lead mines of Craven and district than any other lead mining field in the north of England.

Altogether, some 27 engines have been at work in the area under consideration and of these very little detail has survived. From what evidence that has survived the engines can be classified into three groups:

1. Pumping
2. Winding
3. Dual-purpose

Group 1 can be further divided into Beam pumps of the Cornish pattern and Flat Rod pumps, a type common to the northern mining fields.

The first recorded engine to be erected was on Greenhow Hill at the Craven Cross Mine in 1785, when the mine was being worked by William Wood, and pumped water from the 40 fathom level in the Craven Cross vein. No surface evidence of this engine now remains, although the shaft appears to have been of two stone-lined bores. Cornish type pumping engines, which worked at a low steam pressure, appear to have been used at the Merryfield Hole mine on the New Shaft (55 fathoms), the Providence Shaft, and possibly the Jamie mine on Craven Moor. The engine shaft at the Rimington mines near Chatburn also had an engine mounted at the shaft eye.

The flat-rod pumps, which were the standard pattern for water wheels, appear to have been used by replacing the water wheel with a steam engine, in many places. This would be more economic as the pit-work and rods would with slight modification still be usable with the new power source. At the Cononley Mine, in Airedale, the Engine house of such an engine still remains and the entry of the rod track into the shaft can be seen, although the, 'L' bob has disappeared. However, such an 'L' bob can still be seen in place at the Beavor mine at Yarnbury on Grassington Moor, although this was part of a water powered installation.

At the Appietreewiok mine an engineer by the name of Edward Gledhill from Shrewsbury was engaged in 1869 to erect an engine at the mine: his bill of expenses gives some details of the work;

> "To time occupied from May last in selecting and purchasing a suitable engine and boiler, deciding upon the best

> position for fixing the same and conducting the erection of steam power on the mine. Modifying and adapting the old winding and pumping gear, making same available for new arrangements. Selecting and inspecting erection of ‘L’ and ‘T’ balance bobs, drawing and pumping pulleys and other pit-work about the mine.”

These dual-purpose engines, such as the latter, were much used on Greenhow Hill and it became the practise to site the engine midway between two shafts and provide pumping or winding, or both, to either shaft via power ropes carried on pulley posts. This type of arrangement was used throughout the 1860’s and 1870’s at the New Blackhill Shaft, Donk Shaft, Foxholes-West Shafts, Derby Shaft, and the Hammond and Harris Shafts in the 1890' s. During the 1870’s coal for the engine boilers came to Greenhow either by rail to Pateley Bridge (North Eastern Railway) or by the Leeds & Liverpool Canal to Skipton. From these points it was carted by contractors to the mines. Most of the coal came from the Whitwood, St. John’s, or Allerton Main Collieries. Of these dual-purpose engines, no trace remains except the odd pile of cylinders; the engines, presumably quite small and working at a high pressure were housed in wood or sheet-iron buildings which have long since been demolished.

It is known that small high-pressure engines were used in, the underground installations at the Cockhill and Gillfield mines. No details of the Gillfield engine are known, but at Cockhill the engine was mounted on top of a boiler at the head of the sump and worked a twelve-inch bore plunger pump via a rocker gear. Two Lancashire boilers were situated in a separate room some way from the engine.

During the revival of mining on Greenhow from 1915 to 1937 several steam engines Were in use. At the Foxholes mine, a Fowler engine, possibly an old traction engine, was used for winding and driving the compressors. Another engine powered the surface incline at Gill Heads mine. On the tramway from Gill Heads mine to the Appletreewick mine, a Sentinel vertical boilered locomotive was in use for a short time. At the No.2 shaft on the Craven Cross mine, locomotive boilers were used to feed a twin cylinder winding engine and a single engine for the compressors.

The Cononley mine was reworked for barytes in the 1920’s by an engineer named Murgatroyd and it is said that his winding gear at Mason’s shaft was an old steam crane. J.H. Clay who followed Murgatroyd at Mason’s shaft also had a steam winder which was later moved to the Appletreewick mine.

## List of Mines Worked with Steam Engines in the Craven District.

The following abbreviations have been used in the list:
W: winding engine, W/P: winding and pumping engine, CP: Cornish type pumping engine, FP: flat-rod pump, meaning any pump driven through a secondary motion, SP: steam sinking pump, L: locomotive, SW: steam waggon.

| | | Type | Date of Use |
|---|---|---|---|
| **AIREDALE** | | | |
| Conon1ey, | Engine shaft | FP | c1840 |
| | Masons shaft | W | c1920 |
| | Masons shaft | W | c1930 |
| **WHARFEDALE** | | | |
| Appletreewick, | Engine shaft | W/P | 1870 |
| | South shaft | W | 1923 |
| | Tramway | L | 1923 |
| Gill Heads, | surface incline | W | 1924 |
| | Transport. | SW | c1924 |
| New Blackhill shaft | | W/P | 1872 |
| Foxholes shaft | | W | 1863 |
| | | W | 1915 |
| Jamie Mine | | W/P | c1870 |
| | | SP | 1915 |
| Donk shaft | | W/P | 1872 |
| Hammond, Harris & West shafts | | W,W/P | 1891 |
| Derby shaft | | W | c1875 |
| Craven Cross, | Old Engine | CP | 1785 |
| | No.2 | W/P | 1927 |
| | No.2 | W/P | 1933 |
| **NIDDERDALE** | | | |
| Cockhill Mine | | FP | 1839 |
| | | SP | 1928 |
| Gillfield Mine | | FP | 1839 |
| Woods Old Engine shaft | | CP? | 1803 |
| Providence shaft | | CP | 1838 |
| Sir Thomas shaft | | W | 1859 |
| Hole Bottom shaft | | W | 1859 |
| Merryfield New shaft | | CP | 1826 |
| **RIBBLESDALE** | | | |
| Rimington, Engine shaft | | CP | 1876 |
| | | W | 1876 |

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