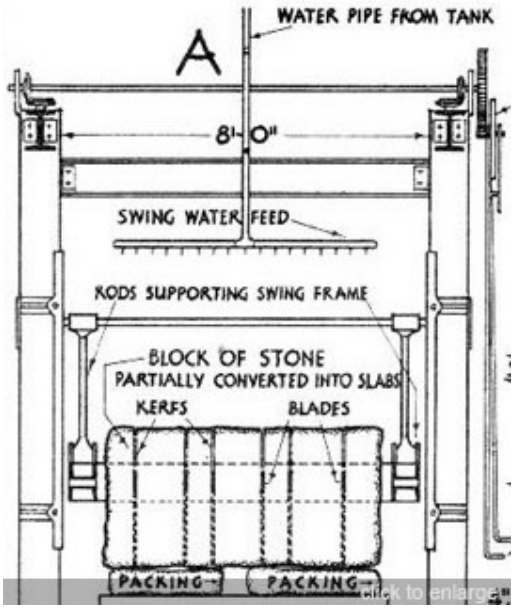
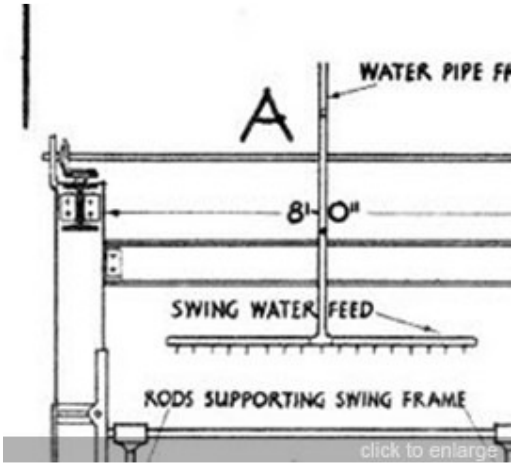
Sawing stone



Sawing gives a better and more accurate surface to stone than can be achieved by a mason. Back in the days when Rossendale's quarries were at their peak, sawing stone was a slow process. However, it did have the advantage that it could be mechanised and driven by water or steam power and it was widely used.



Click to see a description of a frame saw taken from Building Construction by W B McKay, first published in 1944. This text book was widely used by students of building and architecture in the decades following its publication and has now been re-published by Donhead Publishing Ltd. Reproduced by kind permission of Neil McKay and Donhead Publishing Ltd.

The process was simple. Long, straight iron blades were moved backwards and forwards across the stone until they wore their way through it. Abrasive sand or chilled iron shot was added to help the blade cut through the stone and a flow of water kept the blades cool. Saw frames had a number of parallel blades, spaced to give the desired thickness of the sawn stone. Typically, these saws would cut through Haslingden Flag at a rate of about 3 inches (5cm) an hour.

Saw sheds, where the saw frames were housed, were a feature of most large quarries.

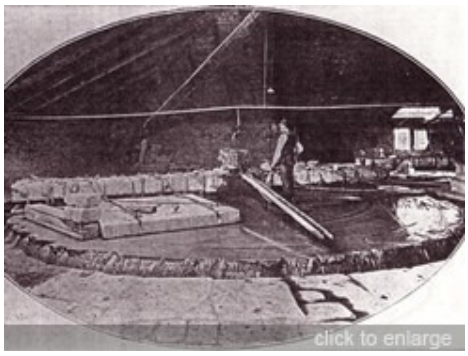
Modern stone saws use circular, diamond-tipped blades driven by an electric motor.

This shows the back of the machine. There appears to be no stone in the machine and the saw blades can be seen clearly. The link by which the frame holding the saw blades is made to move backwards and forwards can be seen in the botom right of the photograph.

Scrubbing mills

A scrubbing or rubbing mill was a method of smoothing flags to be used for house floors and similar purposes, where a smooth surface was demanded.

It was used where the layers of flagstone from the quarry were rough-surfaced or rippled (locally called "dappled"). The flags were first produced by splitting along their cleavage planes, leaving a surface with irregularities. The purpose of the scrubbing mill was to polish out these irregularities, leaving a smooth surface.



Steam driven scrubbing mill at Calderdale

Close up of flag stone chained to beam

A simple scrubbing mill consisted of a circular pit about 5 metres (15ft) across. A layer of the flagstones to be smoothed was placed in the pit and firmly wedged in position. Water or steam power turned a strong vertical shaft which came through the centre of the floor of the pit and slowly rotated a wooden beam. Heavy flags were chained to the wooden beam and were dragged around over the lower flags, rubbing them smooth. Water and sand were added to help the abrasion process. During the polishing process the flags were turned, moved or replaced according to the rapidity with which they were rubbed down.

Earlier scrubbing mills used water power and were located where a plentiful supply of water was available to turn the water wheel, such as at **Dules Mouth** or on Newgate Brook near Turn Village.

Steam powered mills were introduced during the latter half of the 19th century. Steam power allowed much more freedom in where the scrubbing mills could be located. They were built in the quarries or as part of stone processing sites such as Higher Cloughfold. The development of the railways saw steam-powered versions built near the main gauge railway lines, for example at Facit and Broadley stone sidings.

The 19th century was a time of tremendous innovation in engineering and manufacturing, with engineers constantly striving to improve machines and manufacturing processes. Scrubbing mills were obvious candidates for improvement through the skills and ingenuity of the iron machine makers of the time. Two of the people who responded to this challenge were James Coulter and Herbert Harpin from West Yorkshire, an Engineer and a Quarry Owner. In 1865 they were granted a patent for an improved scrubbing mill built from iron. This was an ingenious machine and would have been considerably more efficient than earlier scrubbing mills, but there is no evidence that it was introduced into Rossendale.

The scrubbing process was a simple concept and was widely used in Rossendale, but it was very slow. When the faster process of mechanised sawing of flags became more common, the slow scrubbing process declined and was very uncommon after 1913.

Planing stone

As the demand for Rossendale flagstones increased during the second half of the 19th century, quarry owners sought ways of producing flagstones as quickly and cheaply as possible. Once the stone had been quarried, the main task in making a flagstone was to give the top a flat surface. A new way of doing this was introduced in the 1870s in the form of stone planing machines or "steam masons".

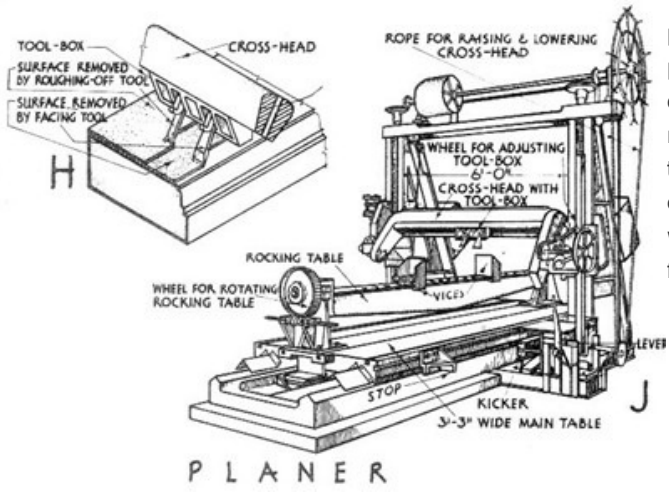
This was a time of advancing mechanisation. By the 1800s machines to replace the lighter craft skills, such as spinning and weaving, were already well established. But now the technologies of machine making had developed so that bigger, stronger and more complex machines could be built. This meant that heavier craft skills such as those of the millwright, stone mason and even machine making itself became candidates for mechanisation.

Machines for planing smooth flat surfaces on iron components were commonplace by the middle of 19th century. Amongst those attempting to achieve the same with stone were James Coulter and Herbert Harpin of West Yorkshire. In their application for a patent in 1872 they state "our invention relates to improvements effected by us in the ordinary planing machines for iron in adapting it for cutting stone". In other words, they took the established process of planing iron and modified it to work successfully on stone. They had created a stone planing machine. Further patents for refinements and variations followed over the next 20 years and Coulter and Company of Bankfoot Foundry in Batley, West Yorkshire, became an established supplier of stone planing machines.

These machines were driven by steam and were known by a number of names such as "Drovers", "Flag Facers" and "Steam Masons". The name "Steam Mason" is particularly apt because the machine worked by pushing the top of the flag against a tool like a chisel, so that it removed a thin layer of stone in much the same way that a mason would do with a hammer and chisel. After the tool had passed along the full length of the flag, the tool was moved sideways for the next pass. This was repeated until it had planed the full width. To speed up the process, planing machines usually had several tools cutting the stone at the same time.

These machines became an integral part of steam driven stone processing. In 1929 Henry Heys and Company had ten planing machines and Siddalls at Stacksteads had eight machines at the close of the firm in 1915.

In Rossendale these machines were used face flagstones, but in where the stone was shaped, they were used shaped stone such as cornices and jambs. To facilitate this



planing principally to other areas, more easily to produce components, window fancier work

the machines were equipped with a rocking table. This is the type of machine described in Building Construction by W B McKay, first published in 1944. This text book was widely used by students of building and architecture in the decades following its publication and has now been re-published by **Donhead Publishing Ltd**.

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