

History

The Durham grist mill was founded by Judge William Long in 1820, and built on the foundation of the Durham Furnace. The furnace operated for 64 years, closing in 1791. The grist mill provided flour, corn, millet, oats, rye, barley, and other ground products to local residents and farmers as well as companies as far away as Philadelphia and New York. Local farmers would sell or barter their grains to the miller, giving a portion of the final product to the miller as payment. This was known as the "toll."

Long distance sales were transported on the Quakertown & Eastern railway, or as it was locally known, the "Quick & Easy." The railway ran alongside the mill where freight cars were loaded with finished product. At one time, the Durham grist mill produced flour for Ceresota, evidenced by the restored Ceresota "bread boy" advertisement on the east side of the building. Toward the end of the mill's commercial production years, it produced far more animal feed than flour. The mill stopped operating as a business in 1967.



How the Mill Worked

The mill was powered entirely by a large water wheel with water supplied by Cooks Creek, also known as Durham Creek. In order to convey the water from the creek to the mill, a mile-long "mill race" led the water to a mill pond. Before the water made its way to the pond, however, the miller had to open a gate stationed at the top of the mill race that held back the water until needed. This dam system ensured there was always enough water to keep the mill running.

The water wheel was connected to the mill's main gearing, a long metal rod that ran up from the basement through each story of the mill. Every gear, belt, and pulley was connected to this shaft. Individual machines and pieces could be engaged and disengaged while the mill was running, in many instances simply by pushing or pulling a wooden lever or "switch."

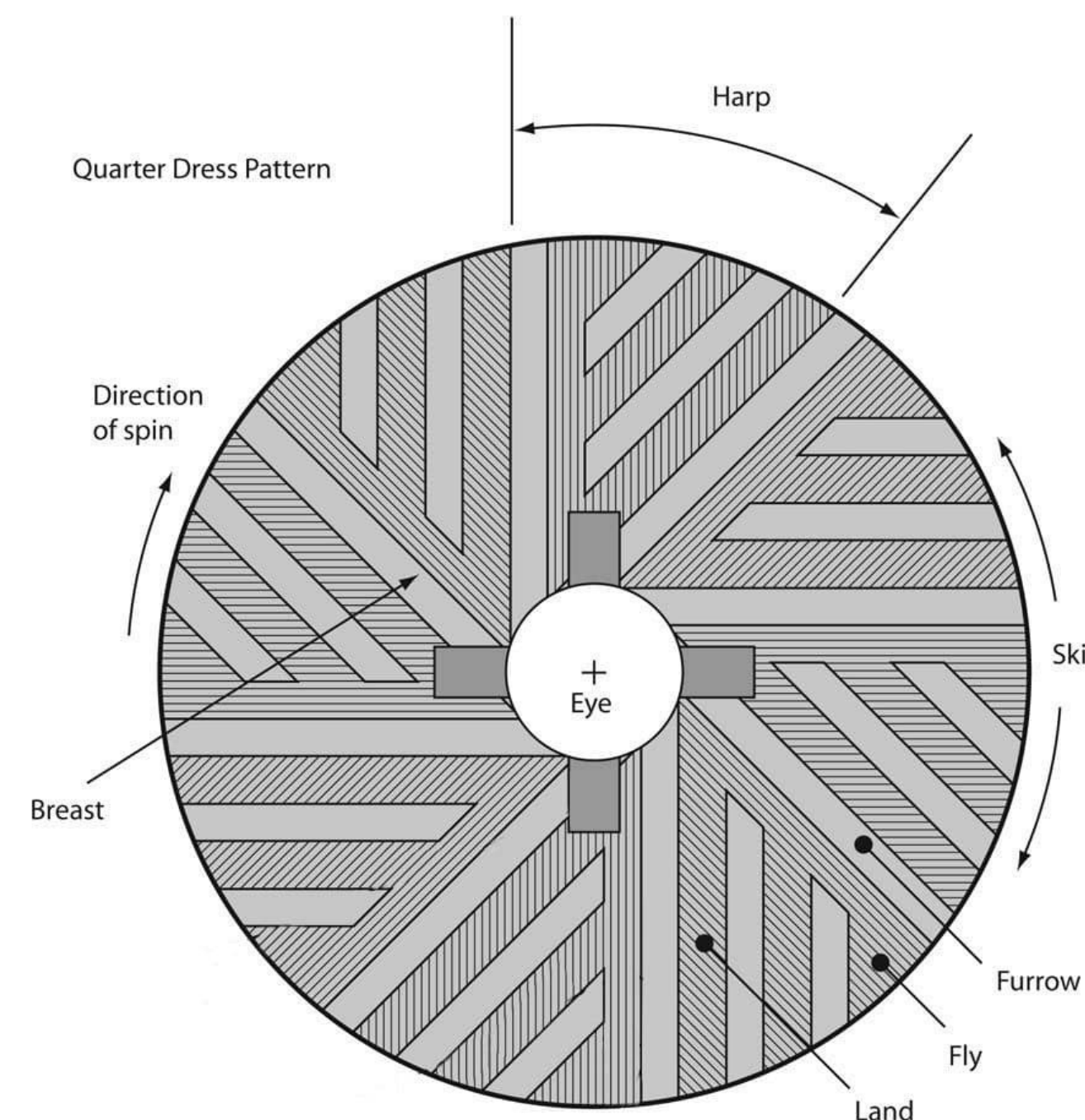


Raw product was delivered to the side of the mill, where it was raised to the top floor via a pulley-hoist system connected to the mill's main gearing. On the upper level, the raw product was cleaned using a separator - a grain-cleaning device that removed sand, dirt, and pebbles by moving them through increasingly finer sifters. Once the unwanted contaminants were removed, the grain was transported to a lower floor via an elevator system, where it was ground by the millstones. When the grinding was finished, the product was conveyed back to an upper floor to go through a final sifting process. Finally, the ground and sifted grain was moved to a packing area where it was loaded into bags and prepared for delivery.

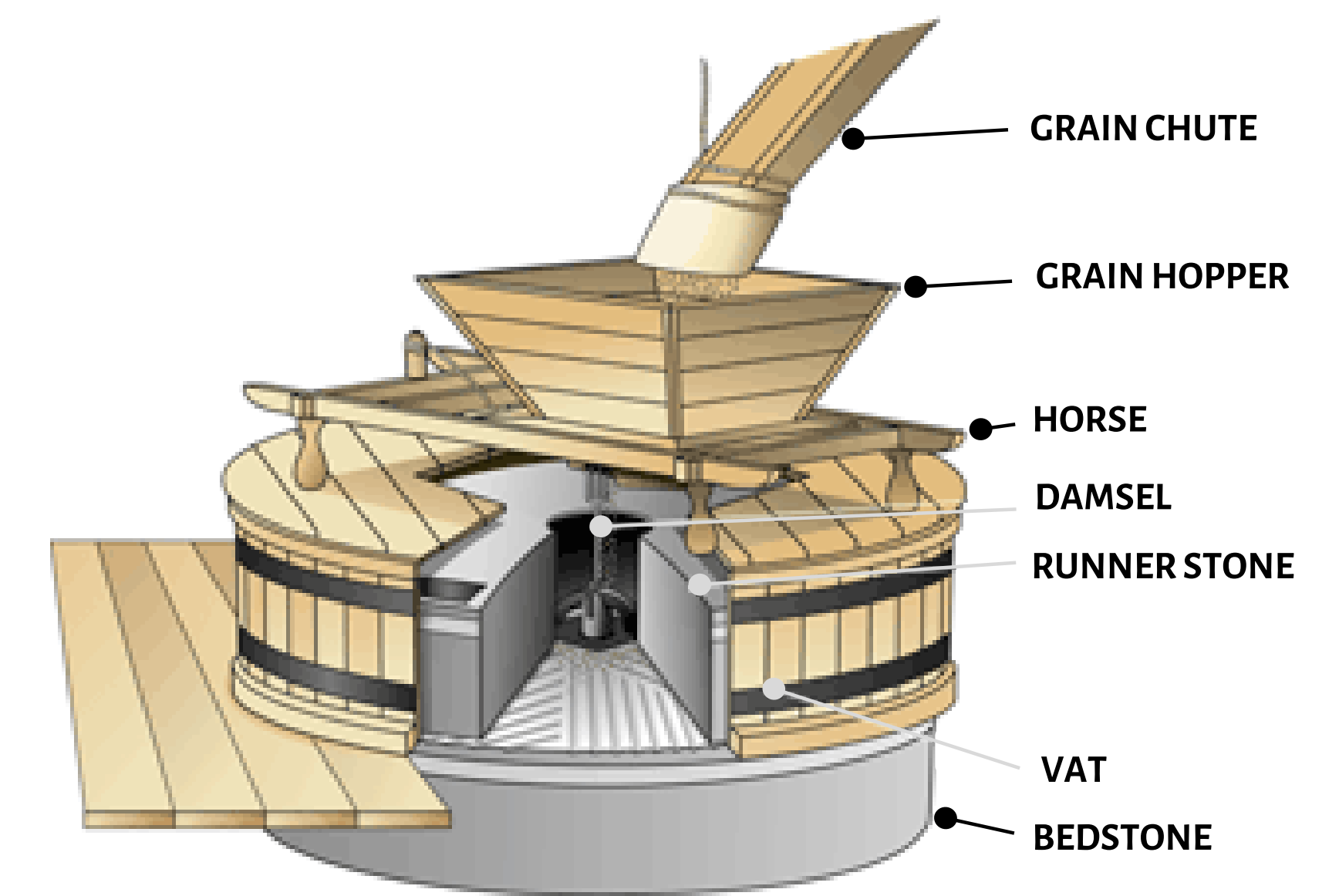
Millstones & The Grinding Process

For the majority of the mill's production years, grain was ground with millstones - large, round, grooved stones ranging from 1 ½ to 5 feet in diameter and weighing up to 2,400 pounds. One stone sat atop the other. The bottom stone, known as the bedstone, was stationary. The top stone, known as the runner stone, was connected to the mill's main gear, and would spin at approximately 70 revolutions per minute. Quantities of grain were dropped through the eye, a hole in the center of the runner stone, where they dispersed outward along furrows that were carved diagonally across the stone's radius. These furrows not only moved the grain from the center to the outside of the stones, but also played a key role in grinding.

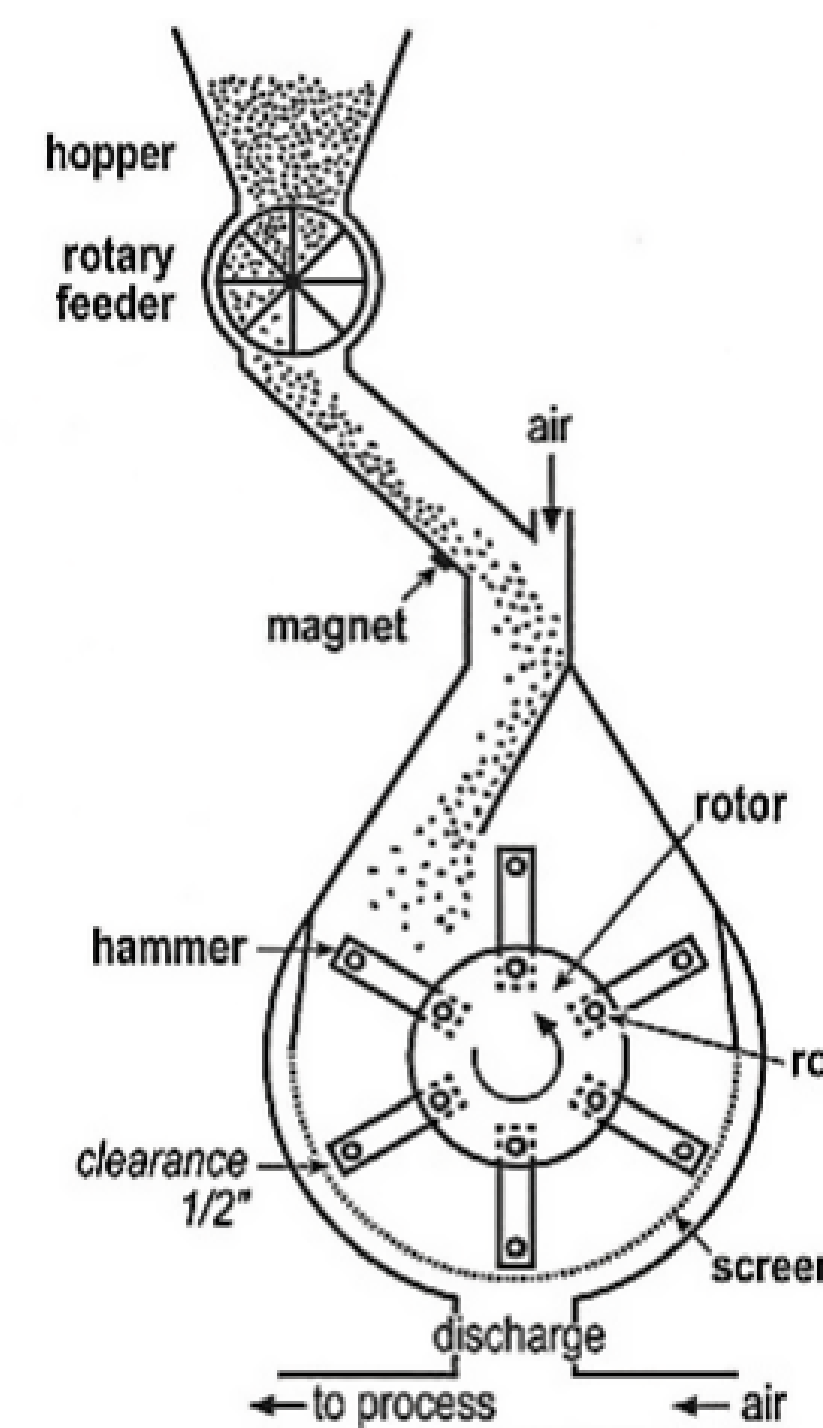
Larger mills had up to six pairs of millstones for different grinding needs and to help process grains faster. The Durham grist mill had four pairs. Millstones used for lower quality products, such as animal feed, were made from cheaper stone, such as local fieldstone cut to size. Millstones used to make higher quality products, such as the flour sold to Ceresota, were made of buhrstone, a siliceous rock imported from France. Due to their massive size and weight, buhrstones were sometimes shipped in separate pieces and assembled on site. All stones had to be periodically cleaned and sharpened. As technology improved, millstones were replaced by the hammer mill and attrition mill, devices still used in mills today.



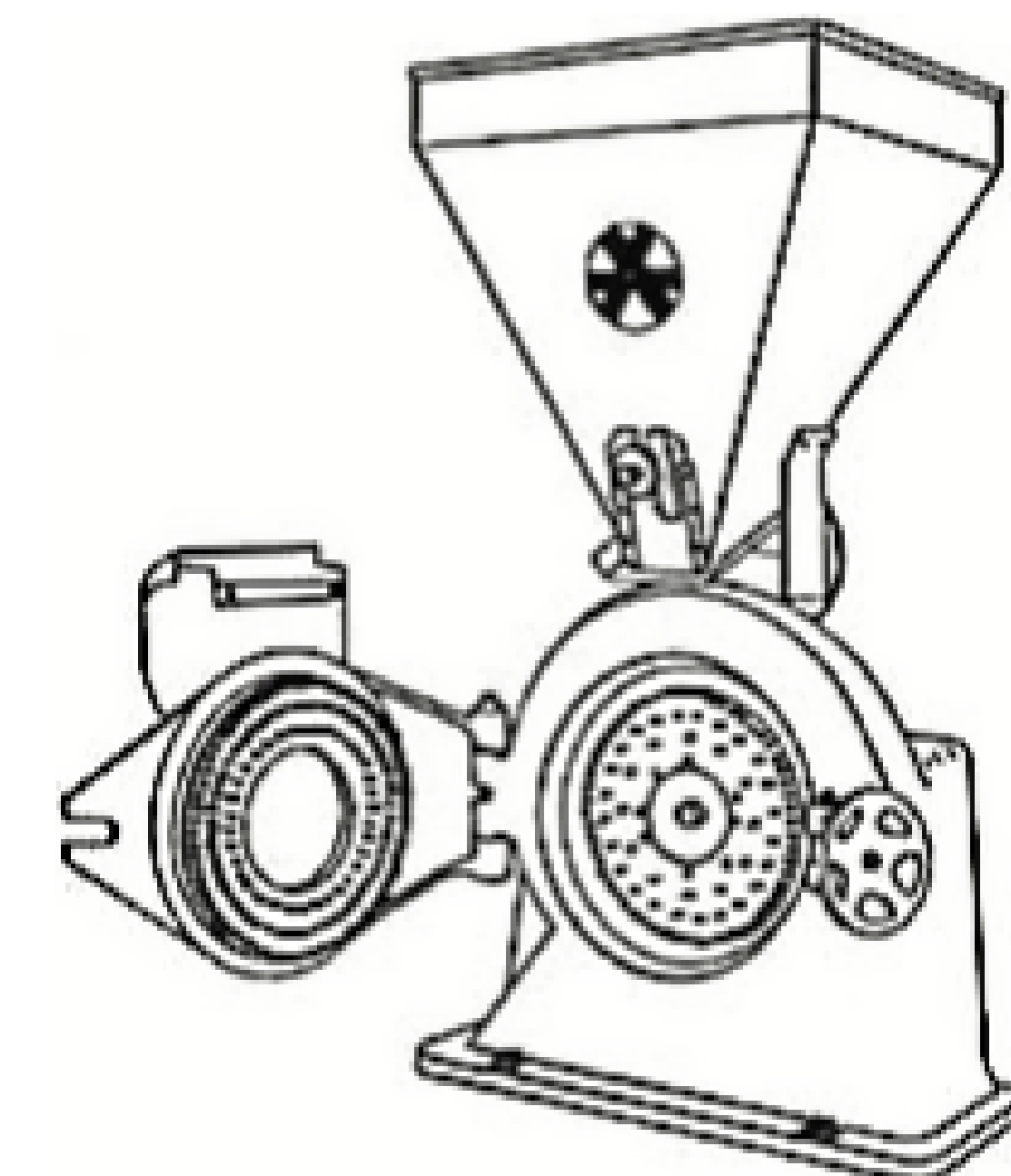
The face of a runner stone



A cross section of millstones



A hammer mill breaks down grain by repeatedly striking it with spinning "hammers" until it falls through a screen below.



An attrition mill also uses millstones, but the stones are smaller and housed inside a casing. Grain is ground vertically, unlike traditional millstones.

Danger & Risks

The greatest risk to employees was a millstone explosion. Single-piece stones could crack and explode due to the extreme pressure of the grinding process. Cannonball-like fragments of stone took out walls and injured or even killed workers. Fire was another danger to workers. Any spark or flame could ignite the highly flammable flour dust in the air. Later, when electricity was installed for light and power, it became the number one reason for fires.

To help prevent fires, tools like shovels and paddles were made from wood, never metal, to avoid the potential of creating sparks. An additional safety precaution was built into the mill's structure: wooden posts and support beams were given chamfered, or rounded, edges, because square edges have a much greater likelihood of catching fire.



Examples of flour mill fires - the Durham grist mill never experienced such a fire

“Showing Your Metal”

Millstone faces required regular sharpening due to the continuous grinding process. Dull stones were “dressed” by tradesmen who hand-sharpened each individual furrow using a small metal pick. These tradesmen traveled from mill to mill offering their sharpening skills. But because millstones were the heart of the miller’s business, a tradesman had to prove to the miller that he was experienced by “showing his metal” - a phrase referring to the metal lodged in the tradesman’s hands as a result of repeating the dressing process many times. The more metal accumulated in a tradesman’s hands, the more experience he appeared to have, and was therefore considered trustworthy as a millstone dresser.



A tradesman dressing a millstone