

What are 'composition' millstones?

Stephen Mills

During Ray Wilson's recent Zoom talk on the mills of the River Chelt and the types of technology employed in them, a viewer asked what was meant by the term 'composition millstones', mentioned during the talk.

Many of us are familiar with the traditional millstones used in corn mills, for example. Where better quality of flour was required, such stones were often constructed from numerous individual blocks of French burrstone, cut and shaped into a circle, then bonded together and ringed with iron hoops – Ray described these (Figure 1). However, they were expensive to produce as they required a lot of time and handwork. As a result, this type of stone tended to be used predominantly where the end product was destined for human consumption. There were alternatives available where cost and/or quality was an issue, or other types of grain were ground, often for animal feed – one option was to use what were generally termed 'composition stones'.



Figure 1 A typical French burrstone – note the individually shaped segments

Gloucester millstone makers

There were several millstone manufacturers based in and around the City of Gloucester, the earliest of which seems to have been J G Francillon, who was located in the city's docks, and was active by the mid 19th century.

Interestingly, William Gardner served his apprenticeship with Francillon, later becoming factory manager, then when Francillon retired in 1861, taking over the business. For many years, Gardner continued to supply French burrstones as well as several types of monolithic millstones (Figure 2), and the company was to remain an important part of Gloucester's millstone supply and production well into the 20th century.

The other manufacturer of note was William Barron, who developed one of the city's foremost mill engineering companies. Initially set up in 1903 by William Stephenson Barron, an experienced and

widely-travelled mill engineer, the company was described (along with its main local rival, Gardner & Co) as having:

Closely followed or sometimes led the way in vast improvement in milling machinery in the last 40 years'.

40 GLOUCESTER & MORETON-IN-THE-MARSH ADVERTISEMENTS.



FRENCH MILLSTONE.

W. GARDNER,
MILLSTONE MANUFACTURER,
 Importer of French Burrs,
 DEALER IN WELSH AND PEAK MILLSTONES,
*Plaster of Paris, Cast Steel Mill Peck, Mill Bill Handles,
 and Iron Provers;*

Flour Dressing Machines, Bolting Cloths, Machine Wire and Brushes, Millers' Brooms, &c. &c.

LLANTHONY ROAD, GLOUCESTER.

Agent for Clarke and Dunham's Patent Balance for Millstones, and Child's Patent American Grain Separator, &c.

Figure 2 Advertisement detailing some of Gardners' mill-related products

Barron quickly achieved a national reputation, especially in the area of flour milling machinery and appliances. The range of equipment produced, and its growing markets signalled a move to larger premises, and between 1932 and 1934, there was a move to a new 7-acre site on the eastern side of the Bristol Road just outside the City. This allowed the construction of a newer more efficient foundry, workshops, and assembly buildings, used to produce a wide range of mixers, crushers, dressing machines and millstones (Figure 3). In 1934, an agreement was reached with the well-known flour milling engineers Henry Simon of Stockport, whereby each company co-operated closely on technical and commercial matters, although each retained its independence. This arrangement was to last for nearly three decades. For much of this time, alongside the manufacture of newer roller mills, the production of traditional millstones (both burrstones and composition stones) continued (Figure 4).

SPECIALITIES:
 Patentees and Makers
 of the
 "Dreadnought" and
 "Super Dreadnought"
 Grinder.

"Dreadnought"
 Composition Millstones.

BARRON'S
 Patent Double Reduction
 Pulverizer.

BARRON'S
 New "Impact" Grinder.

Telegraphic Address: "BARRON, GLOUCESTER."
 Telephone No. 965.

Cable Address: "BARRON, GLOUCESTER."
 Cable Code: A.B.C. Fifth Edition.

W. S. BARRON & SON,
 (W. S. BARRON. G. S. BARRON.)
Millwrights, Engineers and
:: Millstone Builders, ::
Ladybellegate St., GLOUCESTER.
Consulting Engineers. Licensed Valuers.

Figure 3 An advert prior to the company move to the Bristol Road site

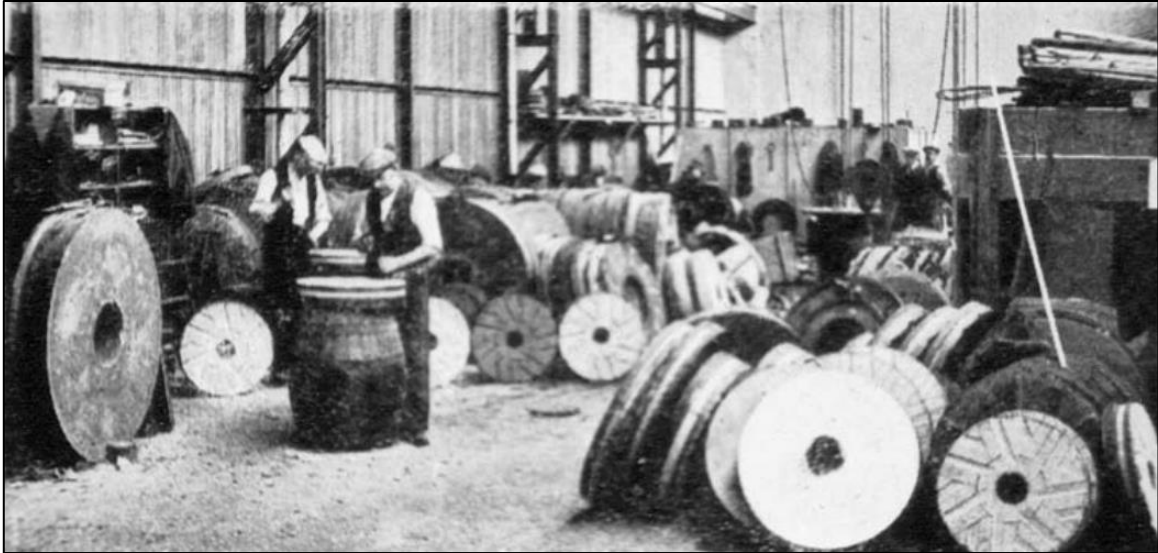


Figure 4 A 1920s view of the Barrons millstone manufacturing shop showing various sized stones being assembled

The manufacture of composition stones

Barrons offered a wide variety of millstones, tailored to different types of cereals, power available, and throughput required. The composition stones were sold under the banner of “Dreadnought composition stones” and were perhaps one of their best-known products. At the height of their popularity, over 1000 pairs a year were being made and sold.

Composition stones were produced in sizes of between 6 and 60 inches diameter and made by grinding down abrasive materials such as French burr, carborundum, or emery, to a particle size of around 0.3 cm or less (Figure 5), embedding them in a strong cement, then applying the mix to a circular mould of appropriate dimensions. They were formed onto a heavy cast iron backplate that provided mechanical strength and doubtless, some momentum when rotating (Figure 6).

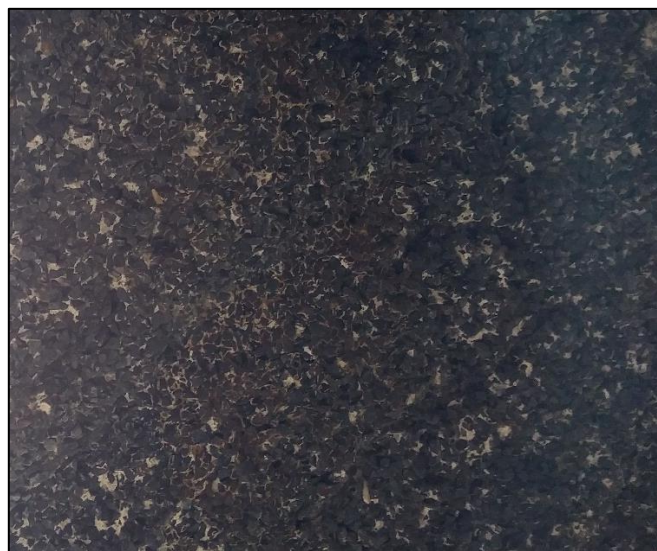


Figure 5 The surface of a composition stone showing individual pieces set in concrete



Figure 6 The heavy iron back of a composition stone. This is a bedstone – note the three lugs that carried adjustment screws

It was possible to change the grinding characteristics of the stone by altering the composition of the mix, making it suitable for a variety of applications. A typical recipe for casting a Dreadnought stone was:

- 4 parts of emery by weight 100 lbs (pounds)
- 1/5th part of above in cement 20 lbs
- 1/4th part of above in liquor 25 lbs

(I think the 'liquor' mentioned may have been brine, sometimes referred to as chloride liquor)

A major advantage was that unlike conventional burrstones that required dressing at frequent intervals, Dreadnought stones required very little attention, leading to a claimed reduction in labour costs of up to 75%. The stones were very popular and supplied to mills across the country. Advertisements noted that:

they do more and better work than any French burr millstone, and equal Peaks as to the quality of the work done.

Another advantage was that they were found to be suitable for grinding at higher speeds than burrstones, especially when auxiliary engines were employed to replace or boost power available from water wheels. Yet another plus was that worn stones could have a new layer of material cast onto their surface, or even cast completely anew onto the iron backplate, resulting in sizeable savings.

Postscript

Some of the information on Barrons came from several visits made to the Bristol Road works in the 1980s and was provided by sales staff and other employees. The site is now covered with housing.