The perseverance flour mills, Elizabethgrad

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Milling journals of the past at The Mills Archive

In 1879 an English engineer, Walter Pridgeon, wrote a report for The Miller (March 3, page 20) describing the Perseverance Flour Mills. He had been working for the engineering firm of Bellino, Fenderich and Co, known for building ships for the Russian Imperial Navy.

Originally based in Odessa, the firm moved deeper into Russia to Rostov on Don. The Perseverance Mills were built in Elizabethgrad, since 2016 known as Kropyvnytskyi. Located about 100 miles north of Odessa, it was an important trade centre on the Inhul River in Ukraine (then part of Russia).

Russia, described in history and public opinion as "unfortunately more prominent as a prosecutor of war on a colossal scale than as a promoter of the arts of peace," nevertheless was unique with its enormous reserves of grain to export.

Twenty-two-years after the article Elizabethgrad, although in the centre of a fertile region, suffered a severe famine. It was an inconvenience unacknowledged by the Government building up its foreign exports.

The foreign grain trade was the most important economic element locally and across the empire. The quantities involved accounted for 45 percent of all goods conveyed by rail and water.

Rye was at the time the principal element in the home trade, but the exports for 1874 were as follows: Wheat: 6.3 million qrs; Rye: 3.5 million qrs; Oats: 2.8 million qrs and other grains: 2.1 million qrs. Most was exported through the Black Sea, but the White Sea and Baltic ports were also very active.

The perseverance flour mills

The mill was built in 1870 in white brick with iron window frames, its dimensions were 75ft long internally, 36ft wide, and four and a half storeys high. The motive power of the mill was a steam engine housed in the engine room at one end of the mill on the ground floor, and carried as high as the second storey.

The engine was a horizontal compound-condensing engine supplied by steam at 80lbs pressure from tubular boilers and capable of working up to 160 horse power. It was built by Bellino, Fenderich & Co according to Pridgeon's design.

The power was taken from the fly wheel of the engine by a belt directly to the main lay shaft of the mill. I have left out more detailed information on the motive power, but anyone wanting to know more please get in touch.

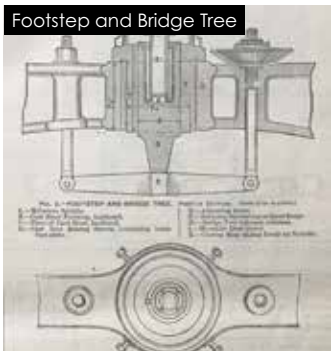
The main driving lay shaft ran along the side of the mill wall and made 150 revolutions per minute. It was fitted with driving pulleys, 3ft 6ins diameter. The 4ft diameter of the spindle pulleys was the same as the millstones. They rotated at 125 rpm, driven by a quarter-twist belt arrangement from the lay shaft. The spindle driving pulley was at the lower end of the spindle close under the bed stone.

The mill was intended for twelve pairs of millstones, arranged longitudinally down its centre. Upon a combined brick and stone foundation, a cast iron base plate was placed with planed faces to receive the turned ends of the hurst columns, between which the bridge trees were bolted to planed faces on the columns.

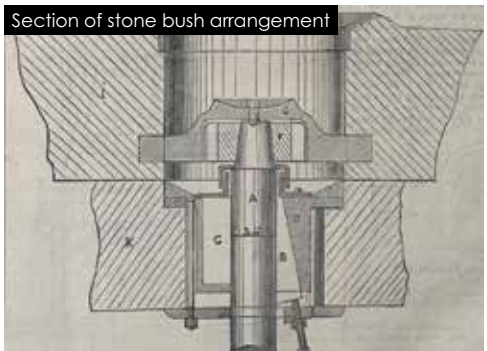
A little higher on the column was a planed facing designed to receive a cast iron girder, with adjustable lignum vitae bearings for the millstone spindle. The main wrought iron girders of the floor above ran over the centre of the columns.

Brackets cast on each side of the column heads supported the iron ribbed plates for the millstones, each being attached to

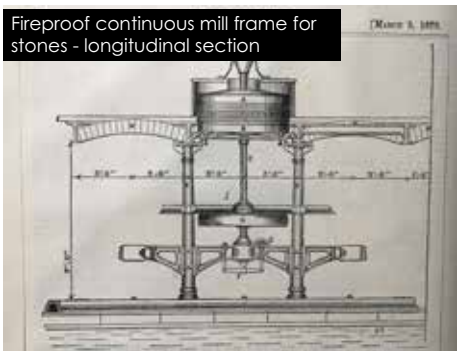
Footstep and Bridge Tree

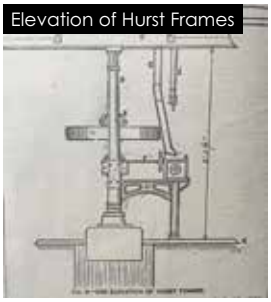


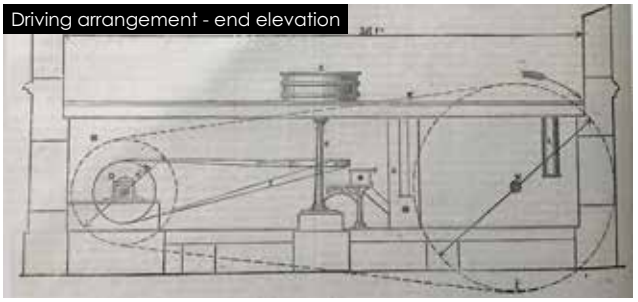
Section of stone bush arrangement



Fireproof continuous mill frame for stones - longitudinal section




Elevation of Hurst Frames


Driving arrangement - end elevation

short wrought iron girders, binding the whole together.

Entirely closed from dust

At the time of the article the mill had six pairs of French burr millstones, the bed stones resting upon iron ribbed plates with three adjusting screws. This ribbed stone plate had an opening in the centre, two feet nine inches diameter, to allow access to the underside of the bed stone bearing.

The spindle toes were carried on the bridge trees. The latter were fitted with brass footstep bearings, a cast iron sliding sleeve and bridging pot. The footstep arrangement was entirely closed from dust of any kind and required oiling only once in three months.

The stone bush was secured to the bed stone by three bolts passing through the flange of the bush and bottom plate. The bush had three wedges and three tallow chambers, fitted with heckle plates in the usual way. The top end of the spindle was turned conically into the mace with a key let into the spindle.

The centre bar formed the saucer for the silent feed, and was fitted with cast steel cock head, and was renewable in a few minutes without the removal of either spindle or centre bar. An advantage of the radial bar was that the surfaces were protected from grit and were always in line with the centre, whatever the space between the driving surfaces of the mace and centre bar.

The pairs of stones were connected with a 24ft long silk dressing machine arranged longitudinally with the mill. The tailing from the flour silk reels passed into other offal silks placed immediately under them on the floor below. The middlings from these silks passed to middlings purifiers to complete their cleaning. Around this time arrangements were being made for putting in Wegmann's porcelain roller mills to work in conjunction with the millstones.

Grain was first screened, separated, and aspirated by revolving six sided reels, with fans attached. Then into a decorticator and lastly a brush machine where it was exposed to a strong blast of air. From here it was conveyed into grain bins over the millstones ready for grinding. A damping apparatus was employed when necessary.

I found the images of the millstone arrangement quite fascinating and hope you enjoyed reading this summary. To date I have not come across any image of the mill itself, or information on when it last worked and what happened to the building and machinery, so if any reader can help with this, I would be so grateful.