

## Messrs J Davidson and Sons' New Phoenix Flour Mills, Newcastle-on-Tyne

### Part 2: The Phoenix expands and is transformed

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### Milling journals of the past at The Mills Archive

**L**ast month I summarised the history of the Davidson milling family up until 1860, when John Davidson passed over to his son ownership of the mill that he had recently rebuilt from the ashes of a horrendous explosion in a neighbouring building. Some years later Messrs. Davidson and Sons', the new name of the firm, adopted the Harrison Carter system in order to have a greater capacity. A new four storey building was erected besides the old mill which was then utilised for the cleaning of grain.

The new mill, as shown on the illustration, was faced by a spacious jetty, the entire length of which was served by two powerful steam cranes. At night the jetty could be illuminated by a lantern enclosing six electric lamps of 50 candlepower each.

An eight-foot covered cart way, passed through the mill, connecting the jetty with the street beyond. The new mill was fitted out to put out 35 sacks of flour per hour, and was built by Mr Walter Scott, from designs by Mr Richard Cail.

#### Built of red brick with stone dressings

The new roller mill was built of red brick with stone dressings,

the interior being lined with white glazed bricks, resting on a keep foundation of concrete and inverted arches. The five floors were carried on rolled iron girders, supported on cast iron columns. A lift and stone staircase gave access to all the floors.

On entering the mill at ground level, there were five lines of shafting which drove the roller mills on the floor above, the shafts being put in motion by ropes, direct from the engine. A row of elevator bottoms was placed longitudinally in the centre of this floor, and eight elevator bottoms of a much larger size were placed in a line against the wall.

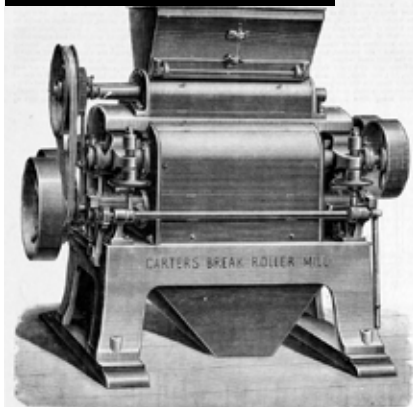
The patent flour and first break flour were 'sacked' on this floor. A stone staircase led to the first floor where there were five rows of double roller mills with automatic feeds, the mills being driven from the five lines of shafting on the floor below.

There were 50 roller mills on this floor, all double machines of which 19 were Carter's grooved chilled iron roller mills for the reduction of the wheat, effected on the seven break system.

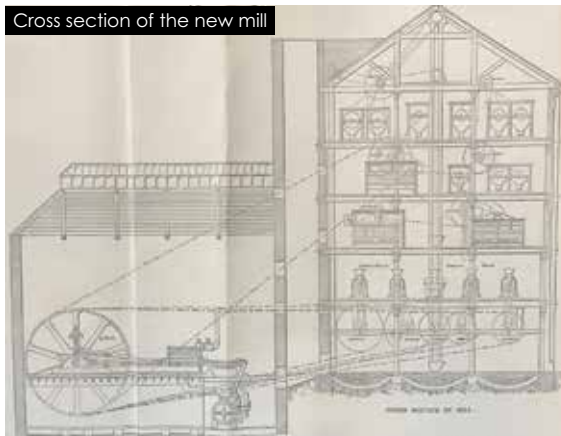
The first and second breaks were produced on two double machines respectively, and three double machines were used for each of the third, fourth, fifth, sixth and seventh breaks.

There was also one grooved double chilled iron roller mill for fine offals and 30 smooth chilled iron roller mills, 20 Carter's and 10 Grays's double mills for middlings reduction. Before being reduced the wheat was graded into four sizes.

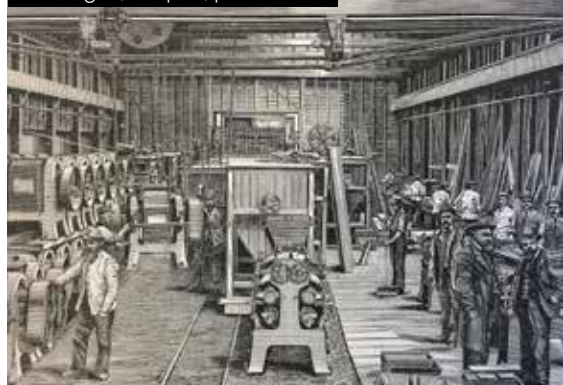
Harrison Carter four roller break mill



Cross section of the new mill



Interior view of erecting shop for centrifugals, scalpers, purifiers etc



## A beautiful effect

The second floor contained the first part of the dressing machinery and 10 scalpers operating on the products from the second, third, fourth, fifth and sixth breaks. Here also was a line of Carter's sieve purifiers, consisting of 10 double machines, two purifiers allotted to each machine.

Leading from this floor to the old mill was a gangway, the sides and roof covered in corrugated sheet iron. The gangway also had three conveyors, one for bringing the cleaned grain from the wheat cleaning department to the mill where it was elevated by means of an upright worm to the graders: the second conveyed the offals to the old mill where it was separated into bran, pollards and sharps, and finally the third conveyed the 'straight run' flour by means of a 12 inch band to the old mill where it was weighted and sacked.

The next floor was furnished with two Davidson's wheat graders, dividing the wheat into four different sizes before going to the first break roll. In addition, there were 26 centrifugal machines manufactured by the mill's own millwrights, one first break flour dressing reel, which separated the middlings, from the crease flour and 22 Carter's gravity semolina purifiers. A beautiful effect was achieved by the machines and their several spouts being in a straight line.

## A site to behold

These machines stood on a conveyor having three separate parallel 'worms' 38ft in length. On this floor was also the main shaft for putting the various dressing machines into motion.

A grooved, 8ft diameter wheel for receiving six ropes, made of cotton 2 inches diameter. was fixed to this shaft, the wheel being connected directly with the grooved wheel of the engine. From this shaft the machines on the second and top floor were put in

motion. The belting for these shafts was supplied by Messrs. Angus & Co, of Newcastle.

The fourth floor had the remainder of the flour dressing machinery, consisting of 9 centrifugals, two of which were used for patent flour, 2 seventh break scalpers, 2 first break scalpers, 4 chop reels, 2 vertical Davidson's bran dusters, 3 double grading reels for the gravity purifiers, 2 double middlings grading reels, 6 re dressing reels, and 1 germ reel.

The wheat cleaning department was in the old mill and the different kinds of wheat were cleaned by means of 3 Davidson's seed separators, 2 Victoria scourers, 3 Young's wheat separators, 4 smutters and 3 sets of Van Gelder's cylinders, 2 Simplex machines, 2 scourers, 2 Throop brush machines and a dryer and washer used for foreign wheats.

The new mill was driven by a pair of horizontal compound surface condensing engines capable of 80 lbs per square inch boiler pressure of developing 600hp. The engine house itself was 50ft long by 26ft wide and 30ft high open timbered, curved ribbed roof surmounted by a lantern light 30ft long. The walls were finished in Keene's cement, with framed pitch pine dado.

