

THE NAILSWORTH ENGINEERS Part 2

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The Turn of the Century

In 1884 Henry King, founder of H.J.H King and Co., Engineers of Nailsworth, sent his eldest son Hubert [1] to Wycliffe College, Stonehouse. He stayed until 1891, playing for the first XI at cricket and the first XV at rugby. He must have had courage as well as sporting ability, for rugby was soon after abandoned by the school as being too rough and soccer was played instead. Scholastic work was not neglected however, for he achieved London Matriculation. [2]

After leaving Wycliffe, he went as a pupil to Fraser and Chalmers of Erith [3], a company with which his father had a business association. I do not know how long he stayed there, but in October 1895 King senior died suddenly, and the young man found himself in charge of his father's business at Lot Mill, Newmarket near Nailsworth. This is graphically shown in the order book of that year, for the handwriting changes markedly after October 5th.

For the first few years of Hubert's reign, the pattern set by the father was continued by the son. Orders for the smaller King products - clutches, governors, heat regulators, sausage stuffers - continued to come in, and the steam engines continued to sell. Hubert continued to assist others (notably the Evans's of Brimscombe) with their occasional patent specifications, and to design and make special machinery for his customers from time to time. Examples included a punching machine for the Stroud Metal Co., and a warping machine for Tubbs and Lewis of Wotton.[4]

The subcontracting work carried on, much of it for local firms. A number of engines, pumps etc. were made for G.Waller and Co of the Phoenix Iron Works, Stroud. A small high pressure engine was built for delivery to the Stroud Workhouse. Kings continued with the general machining and repair work that offered, often of small value. A Mr Taylor of Nailsworth had a hole bored out for 9d., while repairs to motor car parts in 1906 were charged at £2.5s.od.

Some New Products

Like his father, Hubert energetically promoted a number of new products, some of which had only a limited life. Step ladders (in five sizes) and radiators, plain or ornamental, appeared for a while. Some gas engines were supplied, and a few customers' premises were fitted up with electric lighting sets, for example the Lochindaal Distillery, Isle of Islay, took a 225v dynamo, a turbine to drive it and a marble switchboard complete with ammeter, voltmeter, double pole switches and fuse

boxes. It seems likely that the meter and switches were bought in, likewise the dynamos, and perhaps the gas engines also since they do not appear in any surviving sales literature of the period. Presumably the "Kolawitch", that sold well in 15/- tins for a few months in 1899 and then disappeared, never to return, was also bought in. Was it perhaps a patent substance for improving the combustion of coal?

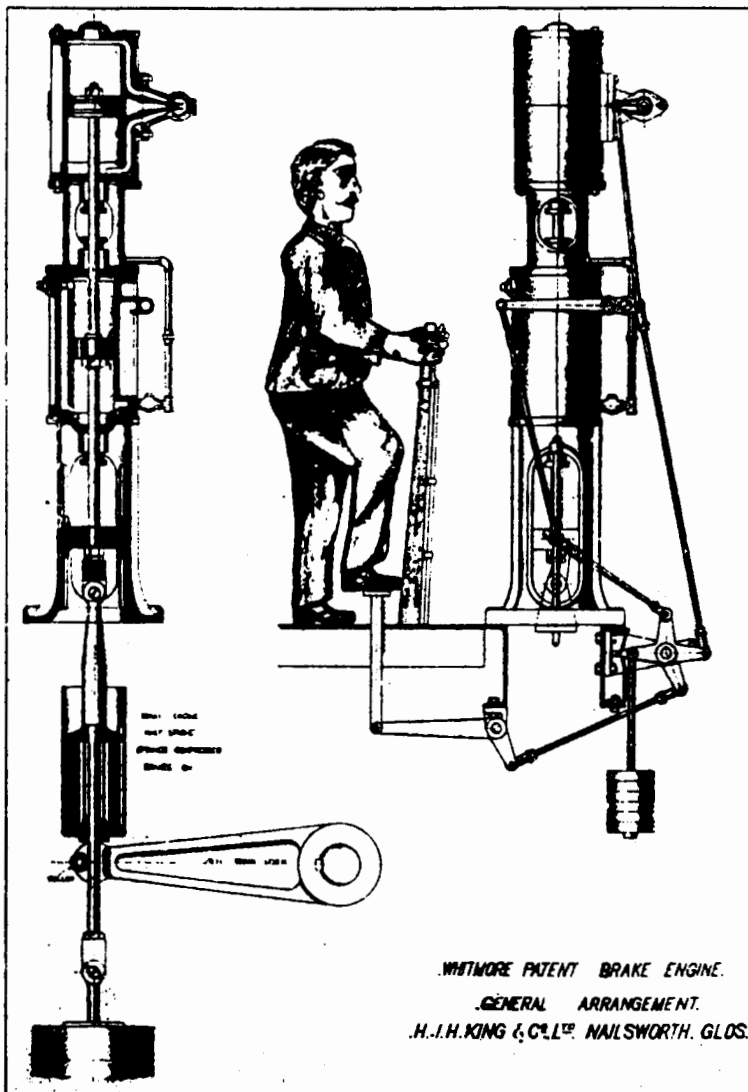
The first of Hubert's products to attain a long commercial life was the range of malting equipment introduced in 1898 which supplemented the successful heat regulators. The first sales were for the new kilns of the Cirencester Brewery, mentioned in Part I. The maltings business developed steadily and stayed with the company to the very end.

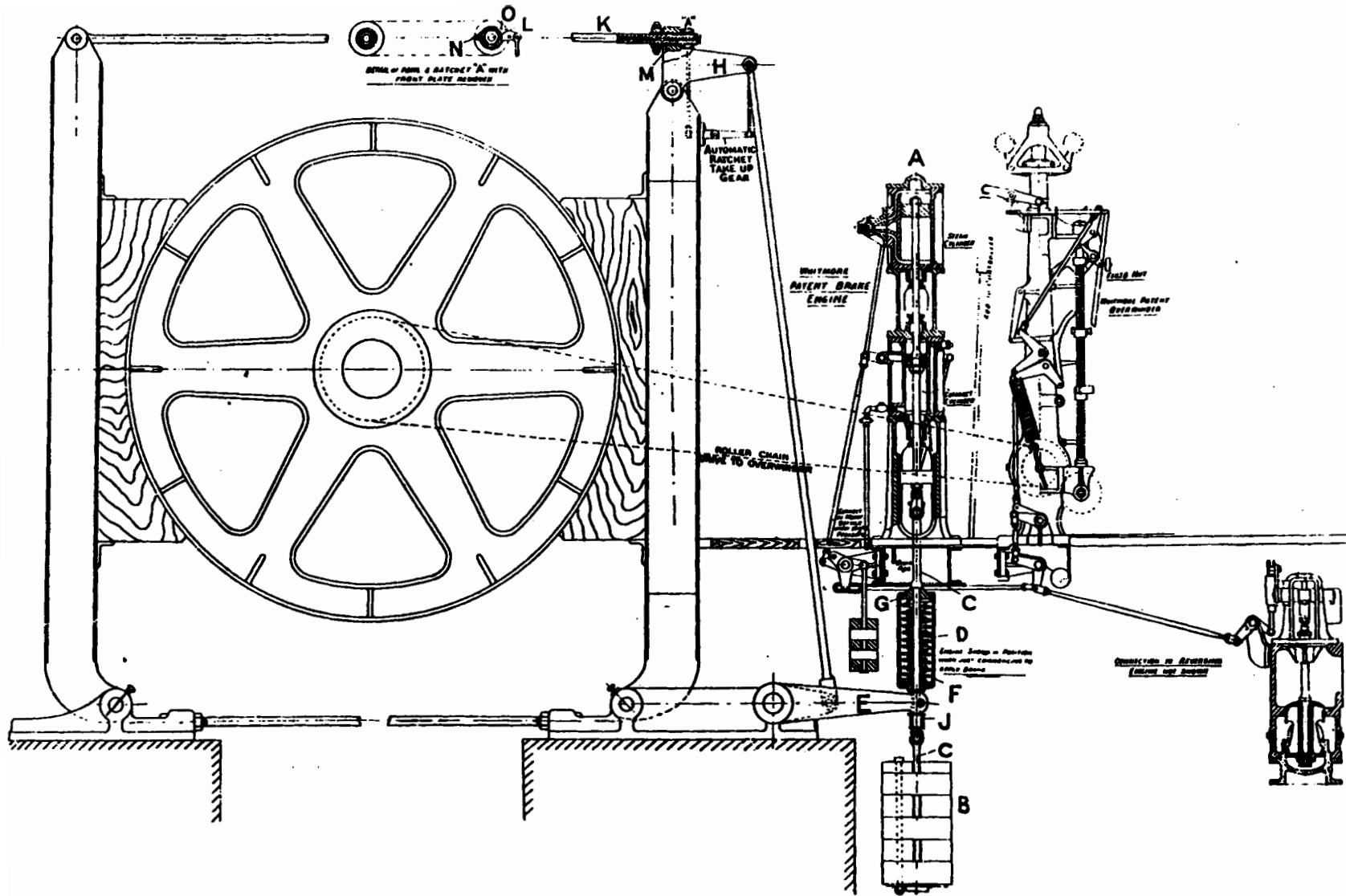
The Whitmore Brake

The next significant venture was in the mining industry, a new field for Kings.

The Overwinder

At the end of the 19th century the coal industry had experienced a tremendous annual growth rate, sustained for seventy years. Output rose from 20 million tons in 1830 to 240 million in 1900, and would reach 280 million tons in 1913.[5] The invention of the Davy lamp had allowed exploitation of seams previously too dangerous, while the development of more and more powerful steam winding engines allowed deeper and deeper pits to be sunk. The Monkwearmouth Pit (1864) went down to 1,700ft. [6] Outputs from bigger and deeper pits necessitated fast winding of coal to the surface, and





Colliery winding drum with wooden brake blocks, actuating gear, Whitmore brake engine and overwinder.

of men up and down. Winding engine men needed to exercise considerable skill to avoid overwinding, which resulted in the cage shooting out of the top of the shaft or hitting the bottom. Winding of coal could be almost continuous. In the thirties a mining engineer stated that at his colliery, the engine man had 70 or 80 opportunities for making a mistake every hour.[7] Inevitably there were accidents.

Overwinding of coal loads resulted in damage to equipment and loss of production. When men were in the cage the consequences could be tragic. 172 men died from shaft accidents in 1875.[8] The search was on to develop gear that would fail safe in the event of human or mechanical failure. The potential market was very large, there being over 2,000 British pits.

The Whitmore Brake engine and Overwind Prevention Gear, to give it its full title, was probably the most successful of the devices to emerge. The patents were acquired by Fraser and Chalmers, who perhaps were unable to meet the demand, for they entrusted their one-time pupil with the sole licence for equipping existing installations with the apparatus.[9]

The first order came in 1907 from a Rotherham colliery and was worth £640. A Fraser and Chalmers fitter was to superintend the installation, charged for at £4 per week of 54 hours. Installation of subsequent orders (if not by colliery staff), was carried out by King people, usually charged at £3 per week. Orders for Over-winders rapidly increased, more than compensating for the loss of orders for the unique steam engine, now obsolete. Technical descriptions of steam engines and over-winders have been published by R.M. Ayres. [10]

Mention should be made of the mine haulage equipment which was produced at this time, mainly gears and the large winding pulleys which, mounted high above the pit head, were a familiar sight in many parts of the country in the hey-day of the coal industry.[11]

Maltings

Two new products were added to the maltings range before 1916. One was an apparatus for turning the bottom layer of malt spread out on a kiln floor to the top to ensure even drying of the malt. The kiln turner comprised a transverse shaft carrying radial scoops, its length equal to the floor width, which travelled from one end of the kiln to the other, rotating as it went. The other new product was a system for conveying malt or barley by suction, the main components being a reciprocating pump, filters, dischargers, and ducting.[12] The system was soon extended to the conveying of coal and other materials.

The First World War

The outbreak of world War I had little immediate impact on the order book. Orders for munitions were not received until well into 1915. Preparations had probably started some time before however, for it is believed that the extra extension that housed the shell loop was built at this time. The machines for turning the shell cases, fuse heads etc. were designed by King. About thirty women were taken on for this work.

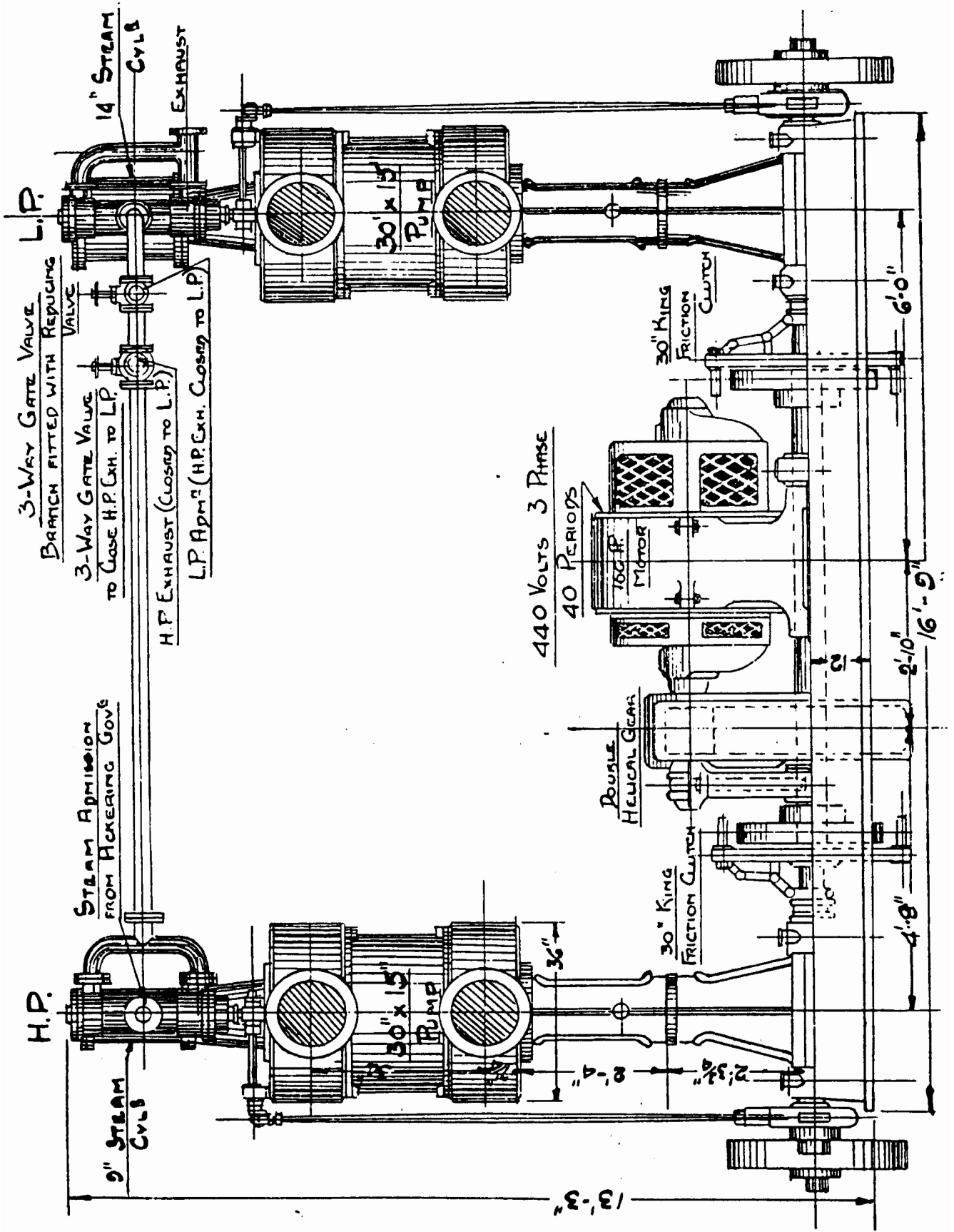
In 1918 the young Albert Wilkins was engaged as an apprentice. His wages were 4/- per week and his parents had to pay a premium of £20, as was usual at the time.

The Twenties

He recalls a very crowded workshop, the machines close together, driven by belts and pulleys from shafting that was sixty to eighty feet long, the shafts driven by a vertical King engine. The floor of the extension was compacted earth, the roof of corrugated iron. Heating was partly by steam pipes from the engine boiler, partly by large coke stoves. Nevertheless it could be bitterly cold on a winter morning! Lighting was by simple gas flares supplemented in places by big paraffin pressure lamps suspended from the roof on ropes and pulleys, so that they could be raised or lowered as required. Some machines were lit by no more than a candle stuck into a large steel nut. Later the lighting improved somewhat when gas lamps with mantles were installed.

There were two forges manned by two blacksmiths and a striker, and a pattern shop with two pattern makers. The old mill building was on a higher level and contained centre lathes and screw cutting machines on the ground floor, while the upper floor, really a loft, was half workshop and half offices and drawing office, with a couple of draughtsmen and one or two tracers.

In the years following the Armistice, the business largely continued along the lines established pre-war. The Overwinder was supplemented by a device, the Slow Banker, to wind at a slower rate when men were riding, especially during the last half turn of the winder drum. By 1929, units had been exported to China, Australia, India, Belgium, Canada and South Africa.[13] Further improvements to the Whitmore gear ("so well known") were described in a paper read to a meeting of mining engineers in 1933.[14] The ensuing discussion showed that accidents could still occur, despite all the effort put into safety systems. Completely automatic protection was very difficult to attain, perhaps impossible using mechanical means. It had to await the introduction of electronic control of electrical winding motors.



Scale: $\frac{1}{2}'' = 1'-0''$

Duplex 30" x 15" Suction Pumps. Motor or Compound Steam Driven.

Materials Handling and Conveying

A pneumatic conveyor was installed at Boots Drug Co. of Nottingham during World War I. It raised coal 85 ft. from barges and deposited it in a 400 ton bunker. "This plant" claimed King "was the first intake plant for coal in commercial use in Great Britain." [15] Later, plants were installed for ore, powdered stone and chemicals. They could be supplied with automatic weighers, the buckets of which would fill to a pre-determined weight, say 5 cwt., whereupon the feed would close and the bucket would tip into a hopper. Portable suction plants were made for unloading barges and railway wagons. Some mechanical conveyors were made. A blowing plant was introduced conveying sewage or "objectionable chemicals". [16] A conveyor was built for Chamberlaine's Mill at Nailsworth, used for bringing coal to the boilers day and night. A resident remembers being kept awake until his complaints induced King to modify the plant for quieter operation.

In the late twenties a system for suction conveying of coal underground was installed in Bowburn Colliery and described in the trade journal. The design of the plant is credited to the colliery engineer, one Kirby, and parts of it were patented by him, but it was built by Kings and much of it (suction pumps for instance) was standard King. The description incidentally gives an insight into conditions prevailing in some pits at the time. The seam was only 23 inches thick, and to enable the men to travel to the face, a small tram with 2½ inch diameter wheels was used, running on a track of 1 ft. gauge. "The men lie on this and propel themselves quite easily, quickly and comfortably to and fro", as much as 200 yards to reach the face. Coal was conveyed in a pipe which ran up to the face. "The men simply shovel the coal in a heap about the mouth of the pipe, when it is quickly carried away". It is mentioned as an incidental advantage, that "the men are working in a clean atmosphere free from dust.... the beneficial effect of this on the health... is most marked and much appreciated." [17] King advertised this as the "K and K" System but orders were not forthcoming, and most pits did not achieve dust free conditions for many years to come.

A plant was designed to extract hot ashes, dust and soot from industrial fire grates while the boiler was working. Water was used to quench the hot ashes and wash them away as a sludge. [18] The testing of this plant had unexpected consequences, as will be seen.

The Depression

The company was hard hit by the Depression, like virtually every other business. Some staff were laid off, others retained on much reduced wages, with a promise to repay the difference when conditions allowed. These drastic measures enabled the firm to survive, and slowly things improved, despite the

temporary set-back of the Great Nailsworth Flood of 1931, when the works was flooded one night to a depth of 15 ft. One day in 1935 Mrs Tanner, a widow, met Hubert King in Nailsworth. "Where's that boy of yours?" he asked. Told that young Ron had left school and was working for Newman Hender, crushing coke, he said "Bring him down to the house this evening". Mother and son stood in the porch of Newmarket Court, the Regency style house since demolished. They were not invited in! "Well Jimmy" (it was always Jimmy) "I'm going to give you an apprenticeship." Mrs. Tanner protested that she could not afford the premium. But none was required, and wages would be £1 per week. This was generous indeed; eight years later, my first job, in London, paid only 17/6.

The Thirties

The following year, the young Mike Vick was engaged in very similar circumstances, incidentally making him the third generation to work for Kings. Hours were 7.30 - 12.30, 1.30 - 5, Saturdays 7.30 - 12. A hooter was blown five minutes before starting time. A good wage for a man was £3 per week. Individual bonuses were paid. Living out allowance, for men installing or repairing plant on customer's, was 5/- per day. No smoking was the rule, and there were no tea breaks. So people sneaked off for tea or a fag. In winter, snow would blow in under the corrugated iron roof and have to be cleared from one's machine before work could start. A man would get a lump of iron heated up in the forge and hang it by his machine for handwarming. Winter had its compensations however, in skating parties held on the nearby Nodes mill pond.

A big hand operated travelling crane is recalled. There were lathes, drilling machines, millers, horizontal and vertical borers, planers and shapers, driven by shafting and belts. Electricity had arrived, but the King steam engine was still in use to drive part of the shafting, the rest being driven by a large electric motor. The lads had to clean the scale out of the boiler regularly, an unpleasant memory for one who recalls his fear of getting stuck in the very restricted space.

Staff was about 30 to 35. A great deal of general engineering sub-contracting was done, for customers like Fielding and Platt of Gloucester, Stoddart and Pitt of Bath and T.H. and J. Daniels. In the early thirties, electric kiln fans were introduced, fitted in the base of the cowl. They were claimed to hasten the drying of the malt by increasing the air flow. The motors were brought in but the blades and fan housings were fabricated in the works. About this time a big Universal milling machine was acquired, on which all types of gears, bevel, spur, worm were cut. Colliery winding gears were cut on it, up to 4 ft. diameter. This required great skill. It is remembered with some pride that very little scrap was produced.

So much hand work in those days! Many parts were forged by the blacksmiths. Ron Tanner remembers his first job. A steel sheet was marked out with the large hole to be cut to take a kiln fan. One of the men drilled a series of small holes all round, the centre was knocked out and the lad had to chip away the waste metal with hammer and chisel, finishing with a file. One day a salesman called and demonstrated cutting the hole with a welding torch in what seemed an amazingly short time.

One had to turn one's hand to whatever work offered, like helping the pattern maker to lay steel girders to support a maple-wood dance floor. On the whole the work is remembered as being varied and interesting, though sub-contract orders for large numbers of a single item could become tedious. Plant testing however could provide a break from routine.

Plant Testing

In those days, equipment was assembled and tested at the works before delivery and installation. Conveyors, which might be hundreds of feet long, were perforce tested in the field outside. Material was fed in at one end while King stationed at the other with stop-watch, recorded the time taken. Once Glauber Salts were used and the dust got everywhere. Another time, bag after bag of beans were fed in. The testing of conveyors for red logwood chips, used up sackfuls of shavings and sawdust. Six were built for Argentina, and a King man travelled out to install them. The story is that the Hot Ash Extractor was being tested, using coal dust and water, when it blew up showering dirty water all over the neighbourhood. Another kind of hazard was revealed during the testing of a bottle handling machine which repeatedly went wrong. An employee who expressed his frustration too strongly found himself suspended for swearing.

Henry James Hubert King

Hubert King is remembered as "a very upright man", an active member of the Baptist Chapel. A good employer (provided one kept to the rules!), owner of one of the first motor cars in the district, which really did go "chitty-chitty-bang-bang". A keen angler, who often fished the Lot mill-pond, or the larger Nodes pond, using a punt fabricated from galvanised steel sheet by the works. His skill with the rod is still remembered. There are many stories about him. When setting out, it is said, on a business tour of his Scottish customers, he would entrain from Nailsworth with suitcase and fishing gear strapped to a bicycle. When taking orders for kiln fans, he would estimate the size of fan housing required from outside the building by sighting the ventilator against a ruler held at arm's length. He was surprisingly accurate. On returning with notes and sketches, he would draw with chalk on the setting-out table, for working-up later into engineering drawings.

The Second World War

Changes in the works were comparatively few between the wars, apart from the installation of electricity. A big 4 ft. by 10 ft. planing machine, weighing over 9 tons and bought second hand in 1893 [19] was still in use. The machines used to turn shell cases in World War I had been taken outside and left on the bank. By 1939 they looked very sad, being rusty and covered in coal dust; at least one employee thought them beyond repair. The bed of one machine was buried in the yard roadway! Nevertheless Hubert brought them in, fettled them up and engaged a staff of women to operate them. The shell shop was in production again.

Other war work undertaken included making parts for tanks. Colliery work continued, and a small amount of maltings work. The works was very busy during the war, and became very crowded. The women apparently found the shell shop cold in winter; for their benefit coke was burned in makeshift braziers, namely oil drums pierced with holes.

Post-War

After the war, no doubt the first priority at Kings, as elsewhere, was "back to normal". A post-war catalogue has survived. Though much thinner, due to the acute paper shortage then prevailing, it is similar to King publications stretching to the early century. "Established for 70 years" is proclaimed on the front page. Some of the illustrations are 40 years old. It features a new drawing, surprisingly crudely executed, showing King equipment in place in a maltings.[20] A later and larger sales publication deals mainly with Overwinders and Slow Bankers; again some illustrations are quite old. The text raises some questions. King's prose, judging by his publicity material, was never especially felicitous, but this document reads quite awkwardly in places, as though written with a blunt pencil.[21]

"Normal" did not last too long however. The coal industry, with capital available after nationalisation, increasingly invested in electric winding motors, and in electronic rather than mechanical control systems. This trend was probably strengthened by a winding accident involving failure of a mechanical overwinder (not a Whitmore).[22]

When Mike Nicholls was apprenticed in 1950, his wages were £2 per week but the premium had returned, at £10. The shop was still very cluttered. The steam engine was no longer in use, though the boiler was sometimes lit to raise steam for testing the brake engines. There was a manger, but King was still very much in charge. When the old gentleman was in the shop, the lads would creep up behind him, trying to paint the heels of his shoes with red oxide. Sometimes they succeeded!

By the fifties, only a few overwinder and Slow Bankers were being made, and they were for stone mines. Of the power transmission products, the clutches had just about ceased. The speed governors had long since ended; only one is recalled after World War I, for a mill in Pennsylvania. Coal conveyors were no longer being made. The sausage stuffer however still sold well, after conversion from mechanical to hydraulic operation. There was a good deal of subcontracting, which with the maltings formed the main work of the company.

Hubert died in 1952, aged 79, and was buried in Shortwood Baptist Cemetery alongside his father.

Postscript

After Hubert's death the company was bought by Jesse Rymer, a one-time apprentice at Lister's, later their Sales Director. He demolished the extension and land-filled the area on the dry side of the dam, bringing the ground level up to the top of the dam. A new and much larger extension was built, all on the same level as the mill lower floor. New offices were built, including one for himself, designed to the dimensions of a favourite carpet! All agreed that the new works was a great improvement over the old.

With the decline of colliery and other work, the maltings business became even more important to Kings. But the industry was entering a period of drastic change. Local brewers were being taken over by national concerns. Production was being concentrated in a few large, highly mechanised plants. To meet the situation, King's technology needed rapid development to meet new requirements, and the company needed considerable reserves to survive in a situation in which contracts were large in value but small in number.

Kings secured a contract for a maltings in Gainsborough, Lincolnshire, as a joint venture with Van Caspel of Belgium, makers of advanced mechanised maltings. This was a very big order, and despite a good deal of subcontracting, Kings were fully stretched. The job was successfully completed, but the company found itself without further orders, and in debt to Redlers for subcontracted conveying and elevating gear. In 1961, the company was bought by Cozens Sutcliffe, the owners of Redlers.

A second big maltings contract was secured, for F. and G. Smith of Great Ryburgh, but by now the company was under the control of Redlers, and in the mid-sixties it was absorbed into the works at Dudbridge and the Nailsworth premises were sold.

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Mike Nicholls of Watledge.
Doug Drake of Amberley.
Redler Ltd of Dudbridge.
Ray Ayres of Camberley.

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