

SURFACE LOAD AND HAUL Pawling and Harnischfeger

Alonzo Pawling and Henry Harnischfeger co-founded a company in 1884 which went on to bear the now globally famous name of P&H Mining, now part of Joy Global. Today, the company designs, manufactures, sells and services P&H branded surface mining equipment including electric shovels, draglines, and drilling equipment. This equipment can be found on 90% of today's global surface mines.



Alonzo Pawling

Alonzo Pawling is the co-founder of what grew to be P&H Mining, which celebrated 125 years of mining industry service in 2009 and is soon to celebrate 130 years. Born in Chicago in 1858, Pawling had become a veteran industrial castings pattern maker by the young age of 27. Starting in 1881, both Pawling and his future partner, highly skilled machinist Harnischfeger, at the time 29, applied their trades for the Milwaukee-based Whitehill Sewing Machine Co. Soon, Pawling's entrepreneurial spirit led him to establish his own gear and pattern making shop in 1883. He would begin supplying Milwaukee industrial firms with wooden patterns for the casting of foundry machining parts.

Desiring additional machining expertise, Pawling asked Harnischfeger to partner with him. The two founded the Pawling & Harnischfeger Machine and Pattern Shop in 1884, which became the precursor to the 'P&H' trademarked

equipment. Although Pawling and Harnischfeger initially served a variety of industries, their early work with customers such as Nordberg and Allis-Chalmers was a driving force in Milwaukee's rising leadership in the manufacturing of mining equipment. The work included providing sub-contract machining of components and assembly work for other industrial concerns. Both men strove to provide their customers with the highest levels of quality and support.



Henry Harnischfeger

The company was soon manufacturing a diverse product range, including industrial sewing-machine components, steam-engine poppet valves, brick-making equipment, grain-drying and beer keg-sealing machines. Consistent quality, backed by something that was clearly lacking at the time - a keen willingness to assemble, maintain and repair machines previously been built, rather than only selling new or updated machines - resulted in a growing volume of repeat orders for P&H and, increasingly, customer recommendations.

Two years later, a manufacturing firm asked them if they would redesign and rebuild a failed overhead travelling bridge crane for their foundry. The original crane had a complex system of ropes and pulleys that had failed during an overload

lift, crashing to the foundry floor, killing the operator. This was P&H's first opportunity to work on such a large machine and the two men set about replacing the rope-and-pulley mechanisms with a simpler system of motor-transmission sets, applied directly to the crane's hoist, trolley and bridge-drive functions. The refurbished crane was a great success, producing immediate performance and reliability gains. Soon after, other manufacturing firms, warehouse operations and railroad maintenance shops began to approach P&H for cranes, and the firm now had a product of its own.

But, this early success didn't last. It was 1893 and a 'banking panic' struck the economy. As a result, P&H suffered a rapid decline in crane demand. Concerned that they had become over-reliant on a single product, they began to explore earthmoving machinery. Coincidentally, in 1893, they also invested in their own electric motors and controls business. Dissatisfied with off-the-shelf motors and controls purchased for their industrial bridge cranes, P&H bought the Gibb Electric Co factory when Westinghouse Electric bought the Gibb business. After three years of investment and overhauling the Gibb operation, they announced the new 'P&H' AC and DC motors, together with their own controls. P&H AC and DC motors are still the prime movers on virtually all P&H equipment today.



While 1914 was a good year for new product development, it was a very sad year for the company as, following a prolonged illness, Pawling died. But, prior to selling his shares to Henry, Alonzo had in 1911 asked his friend and partner to consider always displaying the P&H trademark on any future equipment. By now it was clearly evident that the trademark had acquired a

strong reputation for quality and service excellence. Harnischfeger gladly agreed to Alonzo's wish.

It was also in 1914 that the first earthmoving machines appeared - a P&H Model T-1 gravel tamper and pavement-cutting machine - followed by highly productive wheel and ladder-type trenching machines for pipeline and farmland drainage projects. A model 205 power shovel with a dipper capacity of about 0.25m³ appeared in 1919. Customers liked the product, but requested various improvements, which P&H quickly applied to a successor machine, the 206, produced with a larger 0.5m³ 206A and 0.75m³ 206B. Customers could choose from three prime movers for the 206: a Buda diesel engine; Waukesha gasoline engine, or a P&H electric motor. The success of the electric drive has lasted to this day. The P&H 206 was an instant success and the factory began producing hundreds every year. P&H struggled at first to develop a service-support infrastructure, but eventually a network of service and parts depots was in place in key regions. As areas of North America (and the world) were rapidly developing roads, pipelines, airports and other infrastructure, the push was on for highly productive and versatile machinery. P&H responded in the 1920s with the P&H 300 '8-in-1 Convertibles' - a sturdy crawler-mounted platform upon which the customer could specify attachments ranging from a front shovel, backhoe, skim-scoop or dragline. P&H applied state-of-the-art materials and processes to provide customers with optimum performance and value.



Less than 50 years after its foundation, P&H had invested over \$10 million in the most advanced manufacturing systems and technology available. Precision, high-productivity equipment and other facilities manned by expert machinists and castings specialists combine to provide a workforce of 2,000. When the Great Depression began to hit the global economy in 1929, P&H focused on cost management and limited but continuing

efforts to advance product technology. In 1930, P&H began to replace riveted-construction machinery with an all-welded design for increased machine strength and payload capacity. P&H was so well versed in welding technology that it began developing and manufacturing its own line of welding machines. Sadly 1930 also saw Harnischfeger pass away, only four years

before 1934, when P&H quietly observed 50 years in business and rolled out the Ward-Leonard DC control system to its machines for higher responsiveness and productivity. In 1930, the company already employed nearly 1,500 people. Harnischfeger was succeeded as president by his son Walter. Since then, P&H trademarked products have continued to be recognised as one of the most rugged, reliable and productive series of machines operating in the mining industry.