

Engineering at the Marion Shovel Company in Ohio. In 1930, Joy founded and was president of the Joy Brothers Company where he developed a system of coal saws that could produce "block coal". Coal saw users at this time had an advantage in the domestic market until President Roosevelt set a floor price on slack coal of 75 cents a ton. This prompted Joy to sell the company to Sullivan Machinery Company, who asked him to remain as General Manager of the Mining Machinery Division in Claremont, New Hampshire. In a four-year period, he helped to create nine new cutting machines along with the development of a "saw loader", which was basically a primitive continuous miner.

Joy returned to Joy Manufacturing Company to assist them in another patent litigation against Jeffery Manufacturing (E. C. Morgan). As an engineering consultant in Franklin, Joe created the Joy Safety Coal Drill. Had today's mine safety regulations been in effect, the machine would have been an instant success.

Later, Joy was called to service with the Army as a senior ordnance engineer in charge of development for the Chief of Army Ordnance. Among other accomplishments, he developed a seal of rubber and bronze cuttings which greatly improved the recoiling mechanism of large guns. In 1944, Joy left the Army and returned to Pittsburgh.

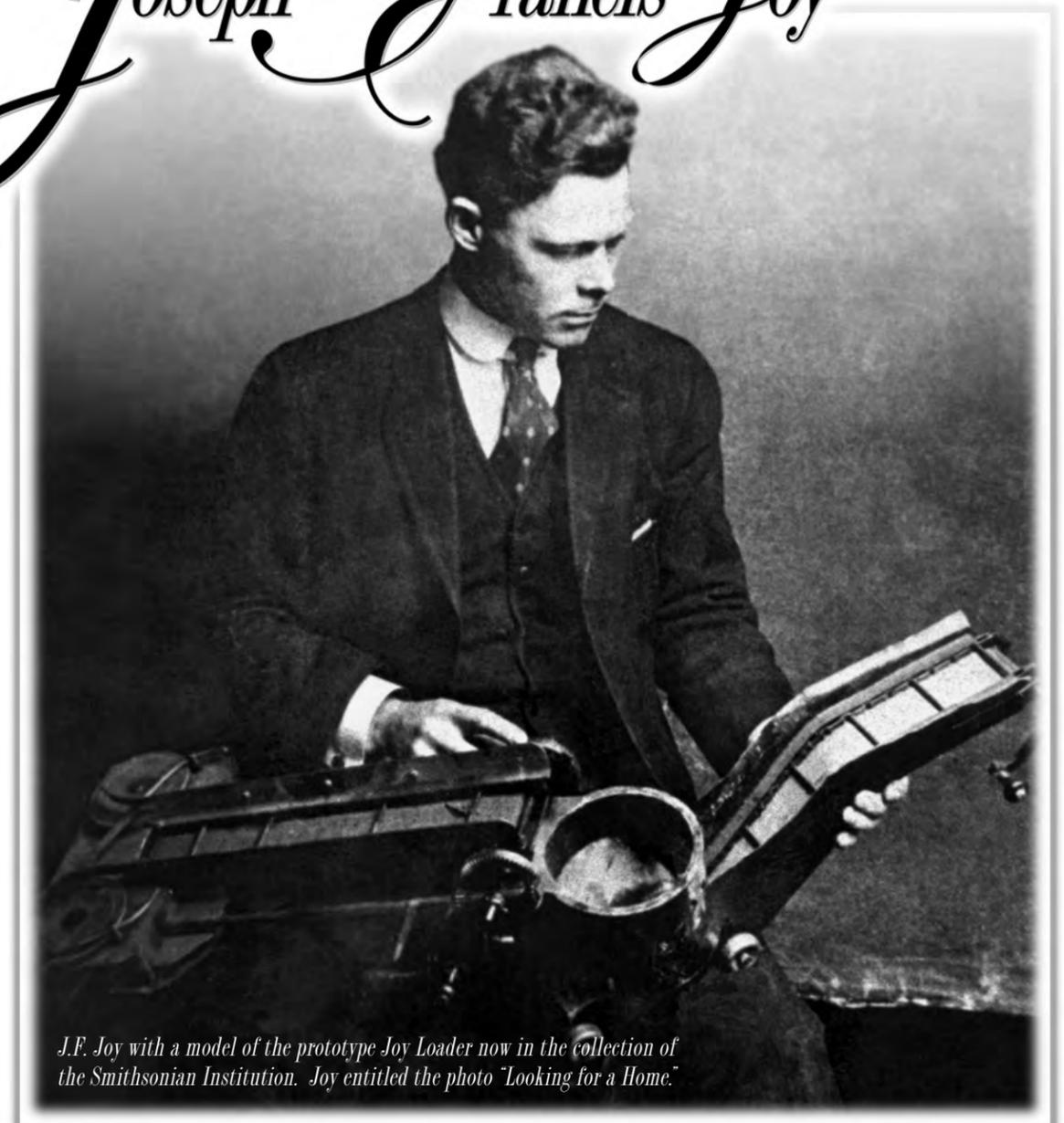
For two years he worked as Vice President and General Manager of Warren Welding and Engineering Company of Ohio. There was never a shortage of work or opportunity for Joe Joy. Numerous mining machinery companies were trying to hire him as a consultant. But it was A. S. Knoizen, Executive Vice President of Joy Manufacturing, who played the key role in bringing Joy back to the company that kept his name after reorganization in 1928.

In 1946, Joy Manufacturing Company awarded Joe Joy a lifetime contract at \$1000 a month, plus materials and expenses, to develop new equipment and methods for the mining industry. Joy moved to Brookside Farms in Pittsburgh where he lived until moving to Ft. Pierce, Florida in 1954. In both locations he had a well-equipped machine shop and designers working for him. Numerous people from Joy Manufacturing Company visited Joe to share information on his latest developments.

Joseph F. Joy died in February of 1957. He accumulated an impressive 190 patents during his career. His major inventions were recognized as milestones in the history of underground mining mechanization. He had pioneered new concepts in hydraulics, modern control and power circuits, trackless mining equipment, efficient gearing and seal designs as well as dozens of other "firsts" in the industry. His contributions changed forever the way minerals are mined.



Joseph Francis Joy



J.F. Joy with a model of the prototype Joy Loader now in the collection of the Smithsonian Institution. Joy entitled the photo "Looking for a Home."

CHARACTER • INVENTOR • REFORMER

Joseph Francis Joy was born September 13, 1883, in the small mining town of Cumberland, Maryland. This was a time when hard work, practical intelligence and thrift were needed to exist. At the early age of 12, as his father and brother before him, Joe Joy went to work at the nearby coal mine. He started as a slate picker, and by age 15 he was working underground as a face-miner using a pick and shovel. He would drill the face with a hand-held auger, charge the holes with dynamite to "shoot down" the coal and then hand-load it into small rail-mounted cars pulled by mules or ponies.

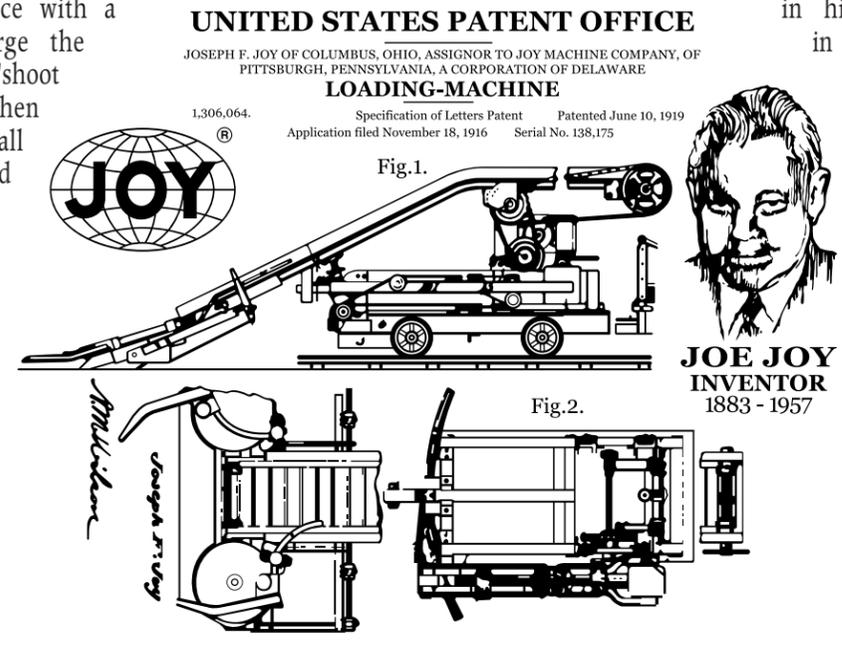
This was hard, dangerous work for strong men, let alone a young boy. While lying on his side soaked in mine water, for long hours as he labored, this bright young man visualized a "better way" to do the work.

Determined to learn and blessed with a precocious ability to persuade others, Joy won the favor of his sisters. They gathered and sold chestnuts to assist his struggling family in their efforts to finance a correspondence course for him in mechanical engineering. On his 20th birthday, the rare combination of his working knowledge, fortitude and specialized education, Joy produced his first sketch of a unique digging and loading device. He proudly shared his idea with a close friend who later provided convincing evidence of Joy's invention of a mechanical loader.

His work in the mines continued where he held every job from pumper to general superintendent. All during this time, Joe Joy attempted to convince others of his mechanical loading device invention. He circulated his drawing trying to persuade various mining companies to help him build his gathering arm loading machine. This

marked the beginning of an uphill struggle to win his first of a total of 190 patents in his name.

Joseph F. Joy's accomplishments are as remarkable as his tenacious nature and aspiring ambition. In 1913, at age 30, Joe took a lower paying job in exchange



The "Joy Loader" patent that J.F. Joy successfully defended from E.C. Morgan and Jeffery Manufacturing

for the opportunity to work on the development of his machine. He was hired as an engineer for Jeffery Manufacturing Company where he spent his days in Pocahontas, Virginia, as a team member developing cutting and loading equipment which included the model 34A, 37A and 38A machines. At night, he continued to develop his gathering arm loader which he eventually presented to Jeffery management. He tried to sell Jeffery the rights to his machine, but his offer was declined because his employer believed that Joy's invention was not his own. They believed the machine already had been invented by a man named E.C. Morgan in 1910.

Joe Joy was not easily dissuaded. He took his invention to senior officer, John A. Donaldson, at the Pittsburgh Coal Co. He demonstrated his model on Donaldson's

desk using dry dog food as the loaded material to be conveyed. Donaldson was so impressed that he requested Jeffery to manufacture this machine. The first gathering arm loader was shipped to Pittsburgh Coal Company's Sommer Number 2 Mine on September 27, 1916. Joe Joy applied for a patent for this gathering arm loader, and continued to work on its testing and development underground. He was awarded a patent, in his name, for the machine in 1919.

The machine proved to be so successful that Jeffery Manufacturing Company tried to claim rights to Joe Joy's invention. This resulted in Joy leaving his position with Jeffery Manufacturing and ultimately led to a patent lawsuit (which Joy successfully won in 1924). He then moved his family to Belle Vernon, Pennsylvania and with his patent in hand, went to work as a consultant to the Pittsburgh Coal Company.

Joy built five similar machines while working for the Pittsburgh Coal Company, all of which were track mounted. Donaldson, while pleased with the progress of the machine, suggested placing it on crawlers to increase its flexibility. However, initial trials seemed unsuccessful and the crawler project was terminated.

Joe Joy viewed this project termination as simply another challenge and believed that he could develop a successful crawler. He also wanted to organize his own company to manufacture and sell his machines to the mines. In one of Joy's final consulting sessions with Pittsburgh Coal, Donaldson pointed out the importance of business capital. With a fond regard for Joy, Mr. Donaldson sent him to visit the office of Pittsburgh Coal Company's legal counsel for assistance, and Joy began to organize his business.

Joy machinery established

On June 4, 1920, the first crawler-mounted JOY loader was manufactured at Traylor Engineering in Allentown, Pennsylvania. Greater mobility proved itself, delighted Joy and promoted more interest in his machine. A major machine order was subcontracted by Joy to Charleroi Iron Works in Charleroi, Pennsylvania.

The first model JOY 4B sold for \$2,800 in September, 1922, to the D. J. Kennedy Company which sold coal, bricks and building supplies. Soon the loaders were successfully operating in West Virginia, Illinois and Saskatchewan, Canada.

By 1923, Joy was looking for a place to call his own; close to a progressive and productive mining area. The site he chose was located in Evansville, Indiana. The model 4A, 4BU and 5BU ("U" referring to its underground application) were developed and manufactured at Joy's first commercial assembly plant in Evansville. One hundred eighty-four 4BU's were sold as the first commercial loading machines of their kind. The 5BU, however, was truly the forerunner of the modern loader, and the first with an articulated conveyor tail section. The first 5BU was manufactured in February, 1923 and installed in what is known today as Freeman Coal's Orient Number 1 Mine in West Frankfort, Illinois.

Joy moves to Franklin, Pennsylvania

Financial difficulties related to rapid growth overwhelmed Joy. He continued to subcontract machines to the Charleroi Iron Works since the Evansville plant was simply too small for continued development of the 4BU and 5BU machines. Joy was unable to obtain a lease on a larger Evansville area plant. Joe Joy approached the Cobern Machine Tool Company of Cleveland, Ohio for help and they responded with an agreement to refinance Joy for \$106,000 in stock and \$19,000 in cash. The transaction included turning over the Cobern plant in Franklin, Pennsylvania to Joy Machine Company with "full ownership of building and lands". In early 1924, the Indiana operation moved to Franklin. At that time,

West Virginia and Pennsylvania coal fields were in rapid development and there appeared to be excellent potential for loaders. The Franklin location was also near other desirable raw materials and steel foundries.

Operations began on March 1, 1924, and the Franklin plant became the first to bear Joy's name. One transplanted employee said, "We came here by car in April of that year and all you could see was hills. My mother took one look at the hills and said that she was taking the next train home!" For approximately 50 Hoosiers from Indiana, the steep hills of Pennsylvania had become a new home.

One hundred eighty-six loading machines were produced from the end of March until December 1, 1924 - all successfully incorporating "field proven" Joy developments. However, financial difficulties plagued the operation and payroll was progressively difficult to meet. At the same time union leader, John L. Lewis called a strike in the bituminous and anthracite coal fields. The effect on Joy's market was disastrous. Fifty machines in production in the plant were held up by creditors and on April 2, 1925, Joe Joy resigned as president, while a committee of creditors took steps to pay off a half-million dollars of debt.

Resigning from his own company was a major blow to Joe Joy. A photo from his private family album reflects his sentiments. The caption reads, "Life's labor lost - broke 1925". The photo also shows Joy dressed warmly for his new and dramatic project halfway around the world. Joseph F. Joy had become the Director of Mine Mechanization in the Donetz Basin in Russia (where it is interesting to note that a young miner who was named Nikita Khrushchev claimed that he ran a Joy loader at about this time). For two



The photo and calling card of J.F. Joy during his Russian employment. As "Director of Mine Mechanization," he was free to develop new ideas and projects in the Donetz Basin coal mines.

years Joy, along with his American engineering associates and support personnel, courageously devoted themselves to the mechanization of Russian coal mines. However, Russia was now under Stalin's rule and the area was turning into a political hotbed. In 1927, fearing for the lives of his staff and himself, Joe commandeered a railroad locomotive and escaped into Poland.

When Joy returned to the United States, he pursued his life as an inventor, including working at the Bethlehem Steel Company in Pittsburgh, Pennsylvania on the design of conveyor systems. Subsequently, he was hired as Assistant Vice President of



An early photo of the 4BU with Dewey Joy. Mr. Joy's brother, at the controls. Dewey Joy was later Sales Manager of Joy Machine Company.