Joseph Battin

Father of the Coal Breaker

Hardly anyone in the anthracite region who bends over the iron-teethed rollers that crack the coal and the screens that sort it into various domestic sizes has ever heard of Joseph Battin. This anonymity is strange, for more than anyone else, Battin has left an indelible mark on the hard coal country in northeastern Pennsylvania with his invention of the coal breaker. His name should rank with James Hargreaves, Edward Cartwright, and Eli Whitney, for his invention probably contributed as much to the Industrial Revolution as the spinning jenny, the power loom, and the cotton gin.

So little is known about him that some writers continue a historical injustice begun long ago by referring to Gideon Bast, instead of to Joseph Battin, as the father of the modern coal breaker.¹ The confusion undoubtedly arises, in part, from the fact that Gideon Bast, one of the first operators in the Broad Mountain tract of Schuylkill County, owned Wolf Creek Colliery near Minersville where Battin erected the first machine for breaking and screening coal. The facts supporting Battin’s claim are found in a few relatively obscure documents.

Joseph Battin had just turned thirty-seven when he introduced the coal breaker that was, in the next century, to pile the mine waste in many a miner’s backyard. The son of poor Quaker parents,² Battin

¹ As late as 1943, McAlister Coleman, in his historical work, Men and Coal (New York, 1943), said: “Gideon Best, of Wolf Creek, Pennsylvania, designed and operated the first breaker at a colliery at Minersville where with circular screens and cast-iron rolls he broke and cleaned two hundred tons of coal a day.” Bast, whose name is misspelled, did not live at Wolf Creek; he lived in a magnificent mansion at Schuylkill Haven. Wolf Creek was, on the other hand, the name of the colliery at Minersville where the first machine for breaking and screening coal was installed. The screens were not circular, but flat.

² His father, Henry Battin, was a descendant of a Norman family which went to England with William the Conqueror. The first Battins who landed on these shores founded Dorchester, Mass., and some of them later settled in Columbia County, Pa. For more of the Battin lineage, consult J. H. Battles’ History of Columbia and Montour Counties, Pa. (Chicago, 1887), 465.
was born on a farm just outside the western edge of the anthracite region, in Greenwood Township, Columbia County, on May 26, 1807. When still a boy, husky and powerful as a young bull, he came out of the highlands to look for a job in Philadelphia.

The Quaker city on the Delaware was the El Dorado of the mechanically inclined; its ambition was to become the workshop of the world. Young Battin gradually worked himself up from obscurity until, in 1838, he received recognition for his aid in building the Northern Liberties Gas Works in that city.

Gaslight in this period was attracting increasing attention as a means of illuminating streets, shops, dwellings and factories. Baltimore had gaslight as early as 1825, when coal was imported from England to manufacture coal gas. Rosin also was used, but it was not as popular as coal gas because it blackened walls and left an offensive odor. The Philadelphia plant is noteworthy because it was the first to extract gas from native supplies of bituminous coal along the Monongahela, Allegheny, and Ohio rivers. Joseph Battin played a major part in its success; he overcame one problem after another which arose from the use of American bituminous coal. So successful was he, that, in 1841, the Board of Managers of Northern Liberties elevated him to the post of superintendent of the gas works.

Battin possessed not only a knack for solving a mechanical problem, but he had as well an infinite capacity for creating new things. The year after he became superintendent, in his own shop not far from the gas works, he had begun to perfect a machine for breaking and screening coal. He knew there was need for such a machine for he had seen the crude methods of preparing anthracite for domestic use when he had gone through the coal fields on his way to visit his parents on the farm north of Bloomsburg.

Furthermore, he had begun his experiments for the most practical of reasons—he needed money. Since his marriage the first day of 1829 to Harriet Strong, he had tried to surpass his father’s progenitiveness of thirteen children. His first child was born the same year of his marriage and another followed regularly every two years until he counted six boys and four girls in the household.

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4 *Gaslight from Bituminous Coal* (Philadelphia, 1850).
6 Dwight, 989.
In his efforts to perfect a labor-saving coal breaker, he used the technique of setting teeth opposite each other in cast-iron rollers. The way the teeth hit together, however, pulverized too much the coal sent through the rollers. Next he placed teeth in one roller in such a way that when it revolved the teeth would fit into the empty spaces between the teeth in the other roller. He turned the two rollers in opposite directions. The rollers, however, were not the most important parts in Battin's idea; what he wanted was a machine to break and screen coal at the same time. Therefore, on the top of the rollers he built a hopper for the coal to pass from the rollers to a long screen hung in an inclined position. The screen, made up of four or five sizes, sorted and cleaned the coal as it passed through the rollers. Battin was now ready to apply for a patent. Taking out a patent in those days was enough to befuddle the wits of any inventor, for nobody knew much about the system. The Patent Office was only seven years old when on September 11, 1843, Battin filed an application for a patent of his invention with the Patent Commissioner in Washington, D. C. Almost a month later, on October 5, 1843, he obtained the first patent ever issued in this country for a "coal-breaking machine." It was U. S. Patent No. 3292.

The Philadelphia inventor soon realized that his first patent did not protect him much. In it he claimed only the combination of a roller breaking machine with a screen for separating the coal into different sizes. He did not claim the manner of arranging and combining the toothed rollers, and for that omission he was to pay heavily in later years. At all events, when he had made certain improvements in the arrangement of the toothed rollers, he applied for a new patent in February, 1844.

In his second application he was more specific. The auxiliary roller, he said, "I sometimes used for the purpose of reducing such large lumps of coal as might not be readily acted upon by the principal rollers. . . . I have found, by continued experiment, that such rollers constitute a real improvement in any breaking machine. . . ." His claim, therefore, was actually for a new invention, and as

7 For a description and drawing of the first coal breaker ever patented in the United States, see U. S. Patents, Vol. 94, Patent No. 3292., n. p., n. d. The original applications for the patents of Battin are on file in the National Archives; the patent volumes cited are in the U. S. Patent Office, Department of Commerce, Washington, D. C.


9 Ibid.
such, an unprotected element of the coal breaker he patented in 1843 was insured.

Battin's first big chance to show the usefulness of the coal breaker came when Gideon Bast, one of the most indefatigable and successful pioneers in the corps of coal operators, asked him to set up the coal breaker at his colliery on Wolf Creek, north of Minersville. Gideon Bast, who was the first to apply steam power to mining, wanted to reduce the labor of preparing marketable coal, and by April, 1844, the Battin coal breaker was in operation at his place. The new breaker, run with a ten horse-power steam engine, saved him the labor of at least sixty men. From then on, more than 200 tons of coal a day were hauled away from Wolf Creek Colliery.

The success of Battin's breaker was so great that other operators hurried to sign agreements with him. The terms under which the breakers were built resembled a page out of Stephen Girard's book. Girard, the Philadelphia financier who owned coal lands in Schuylkill and Columbia counties, leased them to coal operators on a royalty basis. Battin did the same, with a royalty generally fixed at one cent a ton. With coal production rising at an astounding rate, he seemed to be on the road to riches.

In the midst of his early success, he met an English blacksmith named Benjamin Haywood, who in his pretentious machine shops in Pottsville had built a coal breaker in which one roller was fitted with teeth (the same as in Battin's breaker), and the other perforated. When the rollers rotated, the teeth slipped into the holes and thus crushed the coal. On May 21, 1845, Haywood obtained a patent for this breaker, but eight months before he had assigned his rights to Joseph Battin under an unusual agreement. Battin was to pay him $200 for every so-called Battin-Haywood breaker he erected, and Haywood in turn was to become an agent for the duplex breaker.

10 Sarah McCool, "Historical Gleanings of Schuylkill County," Shenandoah Herald, June 13, 1874. Photostatic copies of the McCool Columns, in bound form, are in the State Library, Harrisburg, and in the Pottsville Public Library.
11 Philadelphia Public Ledger, April 6, 1844.
12 Several of these agreements can be consulted in the Loeser Papers in the Schuylkill County Historical Society, Pottsville.
13 W. W. Hagerty, Industrial Heritage of Pottsville and Vicinity, in a scrapbook in the Pottsville Public Library.
The Haywood breaker was first erected at the old Lawton mine on the west side of Mill Creek, north of Pottsville, where Haywood was one of three partners in Milnes, Haywood & Co. By acquiring the patent rights to Haywood's invention, Battin now collected from the company two cents for every ton broken. Thereupon, according to the agreement, Battin paid the royalty to Haywood, not to the company. The Battin-Haywood breaker, however, was not as good as the Battin breaker, and, consequently, Battin found himself building his own breakers and very few, if any, of the Battin-Haywood breakers.

His virtual monopoly in this field was not without its eventual difficulties. His revenue became so large that some coal operators began to skip monthly royalty payments to him, and still others began to infringe on his patent rights. Such action dragged him into both local and federal courts for years to come.

The first time he took a case to court he was defeated. In April, 1847, he sued John Clayton and Enoch W. McGinnis, partners in a coal mine near Pottsville, in a Pennsylvania circuit court to recover damages for infringement of his 1843 patent. The court decided that Battin could not uphold his suit because his first patent covered, the judge reasoned, merely the combination of machinery. As a result, Battin surrendered his patents of 1843 and 1844, and obtained a reissue of the 1843 patent upon an amended specification on September 4, 1849. The patent of 1844 was not reissued. Samuel Battin, the inventor's brother, was listed in the application as the assignee.

Now that they were fortified with stronger claims, the Battin brothers decided to push their claims to the highest court. From their next action grew one of the most important legal cases in the history of the coal industry. In 1850, the Battins, in three separate cases, brought suits against James Taggert, Robert Radcliffe, John Johnson and John G. Hewes for not paying royalties under their patent rights. The defendants pleaded not guilty, and when they came up for trial, the jury returned a verdict in favor of Joseph and Samuel Battin.

16 Publications of the Schuylkill County Historical Society, IV (1912), 140.
18 Ibid, XII, 144.
19 17 Howard, 74-85 (U. S. 1854).
Battin. A new trial was granted, however, when the defense lawyers claimed that they had uncovered new evidence and had found descriptions of old stone crushers in foreign publications with which to argue the case.

The trial finally reached the Pennsylvania Circuit Court in October, 1852. The cases of the four operators were argued and decided together. Judge John K. Kane presided. Although each side had two lawyers, neither enjoyed the privilege of seeing how their arguments affected the jurors, for Judge Kane took charge of the jury. He instructed the jury to return a verdict for the defendants.

Judge Kane, in charging the jury, said\textsuperscript{20}: "Mr. Battin's invention, as he now defines it, was in use for nearly six years before he claimed that it was his property. He had made it known as an unprotected element of the combination he patented in 1843. It was not till 1844 that he asserted any other right in it for himself than he conceded to everybody else. He cannot reclaim what he has thus given to the public."

Joseph Battin was not the type of man to take defeat without question—he took his case to the United States Supreme Court. Associate Justice John McLean, the 69-year-old native of New Jersey, who sat on the Supreme Court bench from 1829 to 1861, delivered the opinion of the high judicial body in the December term, 1854. Some of his remarks reveal the way in which the invention of Battin's breaker was enveloped in legal cobwebs. Said Judge McLean\textsuperscript{21}:

"The patent of 1843 was not surrendered on the obtainment of the patent of 1844. That was intended to be a new invention of arranging and combining the toothed rollers, which, the patentee says, was not made the subject of a claim in the patent of 1843. The patent of 1844 was cancelled, but not reissued, when the patent of 1849 was issued. At that time the patent of 1843, and the improvement thereon, dated January 20, 1844, were surrendered and cancelled, and new letters-patent were issued on an amended specification.

"We think the court also erred in saying to the jury, 'We instruct you that your verdict, in each case, must be for the defendants.'\textsuperscript{20}

\textsuperscript{20} \textit{Ibid.}

\textsuperscript{21} \textit{Ibid.}
"This . . . took from the jury facts which it was their province to examine and determine . . . ; they are to determine whether the invention has been abandoned to the public. . . ."

In reversing the judgment of the Pennsylvania Circuit Court, the United States Supreme Court gave Joseph Battin the victory he had long awaited. But it came just as the 15-year limit of his patent rights were about to expire. Altogether the judicial contests over his claims cost Battin about $100,000.22

If Battin then thought he was through with legal battles, he was sadly mistaken. Benjamin Haywood, who had shipped a large number of prefabricated houses to California during the Gold Rush and had gone out there in a vain attempt to sell them, returned to Pottsville about 1856 to enter the legal arena with Battin. He claimed that he had no return from his invention because Battin did not protect him in his exclusive right to make the breaker and that other persons were making and selling the Battin-Haywood breakers. Battin replied that he had not given anyone permission to build the duplex breaker, but Haywood was insistent. He demanded compensation and damages from Battin amounting to $200 for every breaker embracing his and Battin's improvements.

In an exchange of letters,23 the feud between the two inventors rose to a fever pitch. It did not help Battin's relations with the coal owners, and in the end he offered to settle the matter by paying Haywood either $1,500 in three installments over a period of two years or $1,000 in cash.24

"Battin offers them," wrote his lawyer, William H. Rawle,25 "not because he has the least doubt of his ability to defeat the alleged claim, but that it is for his interest to settle all his difficulties with the coal region at the same time."

The case never reached the courts, for the men reached a mutual settlement.

It is interesting to compare this case with another26 in which Battin was the plaintiff. In March, 1867, he showed Henry Martin,

22 Elizabeth Daily Journal, August 29, 1893.
23 Some of the correspondence is preserved in the Loeser Papers.
24 Loeser Papers, XIII, 164.
25 In a letter to John Hughes, attorney for Haywood, June 18, 1858, filed with the Loeser Papers.
then a resident of Bergen township in Hudson County, New Jersey, a rough model of a machine for making bricks. Martin agreed to take the model, improve and perfect it, procure a patent for it in his name, and share the profits with Battin.

Soon afterwards Martin disappeared, and it was not until 1889, when reading an advertisement in a trade journal, that Battin located him in Lancaster, Pennsylvania, where he was selling hundreds of the brick-making machine. Lambert B. Battin, Joseph Battin's son and legal guardian, brought suit to recover half of the profits, but the Common Pleas Court of Lancaster County held that one joint owner of a patent cannot sue another for infringement or compel distribution of profits.

Despite all these years of litigation, Battin was not as poor as some people believed. With his inventive genius and business foresight, he had resigned from the Northern Liberties Gas Company in 1845 to start a contracting business, Battin, Dungan & Co. Battin was manager, and C. B. Dungan, who had worked with him at Northern Liberties, was secretary and treasurer of the new firm.

The company's first contract, with Battin in charge, was to construct a gas works in Albany, New York. The capital of the Empire State found in Battin a clever engineer. He not only laid the main pipes and built a gas manufacturing plant way ahead of schedule, but he also improved the style of gas burners and invented a water seal valve to prevent the flow of gas while making repairs and improvements. "One of the most practical engineers that we have ever known," exclaimed H. L. Webb, president of the Albany Gaslight Company.27

Battin's business skyrocketed. During the next four years he had contracts to build gas works in Newark28 and Paterson, New Jersey, in New Haven and Hartford, Connecticut, in Rochester and Syracuse, New York, in Charleston, South Carolina, in Richmond, Virginia, in Reading and Scranton, Pennsylvania, and in Washington, D. C. He did much of the work himself because he always considered himself a workingman. Actually, however, it gave him a chance to better the gas equipment he installed.

27 Gaslight from Bituminous Coal.
28 For more details of what he did in Newark, see William H. Shaw, History of Essex and Hudson Counties, New Jersey (Philadelphia, 1884), I, 638.
In New Haven, for example, he conducted a series of experiments with Benjamin Silliman, Jr., the noted Yale chemist, to show the advantages of coal gas over any other means of obtaining artificial light. Spermaceti candles were rated second to coal gas at the time. They found that ten of Battin's batwing burners would produce as much light as 100 sperm candles. They found that it would cost the city about twenty-two cents an hour to make from sperm candles the same amount of light as Battin's burners could give for two cents and four mils.

After constructing gas works in many large cities, Battin turned his attention to water works. His most notable engineering feat was the construction of a tunnel under Black Rock Harbor in Niagara River, for the purpose of supplying the city of Buffalo with water from Lake Erie. It took almost two years to complete the job. After that, in 1852, he dissolved the firm to devote more time to fighting those who were trying to use his coal-breaking machine without paying royalties.

With the advent of the Supreme Court victory, some citizens of Elizabeth, New Jersey, repeatedly asked him to construct a water works for their sprawling city which lay fourteen miles southwest of New York City. Finally, he could resist no longer. A water company was organized with Battin as its first president. He liked the city so much that he moved his family from Newark, where they had lived for twenty-two years after leaving Philadelphia, to a large brownstone mansion on South Broad Street in Elizabeth.

Few cities had seen a figure like this inventor, dressed in a black linen suit and a white shirt with a Spanish collar. His fiery eyes, deep-set as the coal shafts into the side of a mountain, gave his Vandyke-trimmed face a double-edged appearance. His commanding appearance was heightened by a leonine head of flowing white hair. His mustaches certainly gave no clue that he suffered from varicose veins; they curled outward as if he were a man bursting with energy. And, of course, he was. His showing of his inventions in public completed the classic picture of an eccentric inventor.

29 Hartford Daily Courant, January 10, 1849.
30 Newark Evening News, July 5, 1904.
31 Battin obituary, Elizabeth Daily Journal, August 29, 1893.
32 Anthony Dimock, onetime president of the Pacific Mail Steamship Co., built this mansion before the panic of 1873.
One day when he was still president of the Elizabeth Water Company, he appeared before the City Council to request a permit to use a steam carriage along the streets. The president of the City Council looked at him as if he did not quite understand.33

"Come out to see it," Battin urged.

The councilmen were amazed. The steam engine was built in the form of a man and equipped with large wheels. Battin hid himself inside the curious looking vehicle and started the boiler. He set the car in motion and traveled down the street and back. Members of the City Council nodded their heads. The steam man, as Battin was called from then on, received a permit to use it as a public vehicle.

Battin did not consider himself too old to drive the heavy car wherever he pleased. Often he took it to the state fair at Waverly, near Elizabeth, and in between horse races he rode it around the fairground track, amusing thousands of spectators. Because the vehicle weighed so much, little bridges were constructed along the routes he usually took so that he could cross gutters without calling on anyone for help. When too many horses reared in alarm at the contraption, Battin finally abandoned it. But some of the dents the steam carriage made in street curbs are still visible.

Battin’s contribution to the cause of free education is better remembered in Elizabeth today than anything else he did. On March 23, 1889, he turned over to the city the deed to his $250,000 mansion for a high school which now bears his name.34 Its interior was of carved oak and mahogany, the grand winding staircase alone costing $40,000. In his letter with the deed Battin said35:

"The experience and observation of my long life have taught me that 'Knowledge is Power.' In making this gift it is my earnest wish and hope that every available means for education shall be afforded the youths of our city who may come after me."

The entire city came together to thank him for his gift. "Today,"

33 The story of the steam-driven vehicle is told by an anonymous writer in the letters-to-the-editor column of the Elizabeth Daily Journal. Unfortunately, the date of the letter, which I consulted in the Elizabeth Public Library, is missing. Moreover, the Newark Evening News, July 5, 1904, claims that it was the "first steam carriage used on public roads," and also claims that Battin owned the first steel yacht in the United States. No further details could be found to support the claims.

34 F. W. Ricord, History of Union County, N. J. (Newark, 1897).
35 Elizabeth Daily Journal, March 26, 1889.
boasted the *Elizabeth Daily Journal* of March 26, 1889, "Elizabeth owns the most magnificent high school building in the state of New Jersey."

Meanwhile, Reverend Albert Simpson, president of the Christian Alliance and pastor of Gospel Tabernacle in New York, saw in the venerable citizen of Elizabeth a financial angel for new temples. From that time "Simpson followed him closely, coddling him in every possible way, and endeavoring to wheedle money out of him."\(^{36}\)

Although reared in the Quaker faith, Joseph Battin had changed to the Baptist church upon his marriage, and in his later years gave liberally of his means toward the support of religious and charitable works. He had no dealings with doctors, and when he believed he was relieved of varicose veins by his faith in God, he became a convert to the faith-cure doctrine.\(^{37}\)

After he gave the Christian Alliance a $100,000 building in New York and land in Elizabeth on which to build a faith-cure temple,\(^{38}\) his children became alarmed lest the faith curists should get all his money. By that time, however, Battin had made ample provisions for them, and he refused to change his course. He was so infatuated with faith curism that he moved out of his daughter's home in Elizabeth to the Berachah Home in New York, where Reverend Simpson lived. Four months later, in August, 1891, two of his sons, Sylvester\(^{39}\) and Lambert,\(^{40}\) who stepped in to stop his remarkable liberality, were appointed his legal guardians.\(^{41}\)

Unlike Stephen Girard, who endowed Girard College for the education of orphan boys first from Philadelphia and second from the anthracite region, the philanthropic Battin left no money for the

\(^{36}\) *New York Tribune*, June 21, 1891.

\(^{37}\) *New York Times*, June 21, 1891.

\(^{38}\) *New York Times*, August 30, 1893.

\(^{39}\) There is a short sketch of Sylvester Battin in the *National Cyclopedia of American Biography* (New York, 1906), XIII, 211.

\(^{40}\) Lambert Battin succeeded his father as head of the Elizabeth Water Co. Under the terms of Joseph Battin's will, his six children were to receive a certain amount from the estate, valued at the time of his death at $119,342, with the provision that twenty-one years after the death of the last surviving child, the trust was to be distributed among the surviving heirs. Lambert B. Battin, who died February 12, 1918, was the last surviving child. Twenty-one years later, when the principal estate was valued at $216,421, the first distribution of the trust was made.

\(^{41}\) *New York Times*, August 15, 1891.
education of coal miners’ children. Instead, he left something which forced young boys during his lifetime to leave school at the age of eight or nine in order to earn money picking slate in the breaker to help the family finances. There was no place more cruel and hopeless for a boy than a coal breaker. It not only left its mark upon the people of the coal belt, but also marked the area where man-made mountains of coal dirt, slate, and rock were to rise somber and black toward the sky.

The coal breaker left its mark, too, upon the literature of the hard coal country. Russell Janney, for example, painted a lurid picture of a towering breaker to provide local color in the opening scenes of his novel, *The Miracle of the Bells*. Breaker boys are the heroes in works of an earlier period—in Homer Greene’s *Burnham Breaker* and Kirk Munroe’s *Derrick Sterling*. Even Clarence Darrow, noted defense lawyer, who visited the region with Johnny Mitchell, the miners’ patron saint, during the anthracite strike of 1902, wrote a short story called *The Breaker Boy*.

Since Joseph Battin’s death on August 29, 1893, the coal breaker has changed a good deal in size and power. Today the breaker, as Janney writes, “could smile indulgently when cities boast of their skyscrapers.” It now operates by electricity, each piece of machinery having a separate motor. Two of the largest coal breakers in the world, one at St. Nicholas and the other at Locust Summit, prepare at least 10,000 tons of coal daily for markets in New England and the Middle Atlantic states. Despite all the modern improvements, Battin’s idea of rollers and screens is just as much in vogue as it was the day he set up his first coal breaker near Minersville a little over a hundred years ago.

*Philadelphia*

Edward Pinkowski