EUREKA!

The Journal of Mining Collectibles

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Cover illustration: Kerckhoff patent candlestick with removable hook. Wendlell Wilson collection and photograph.

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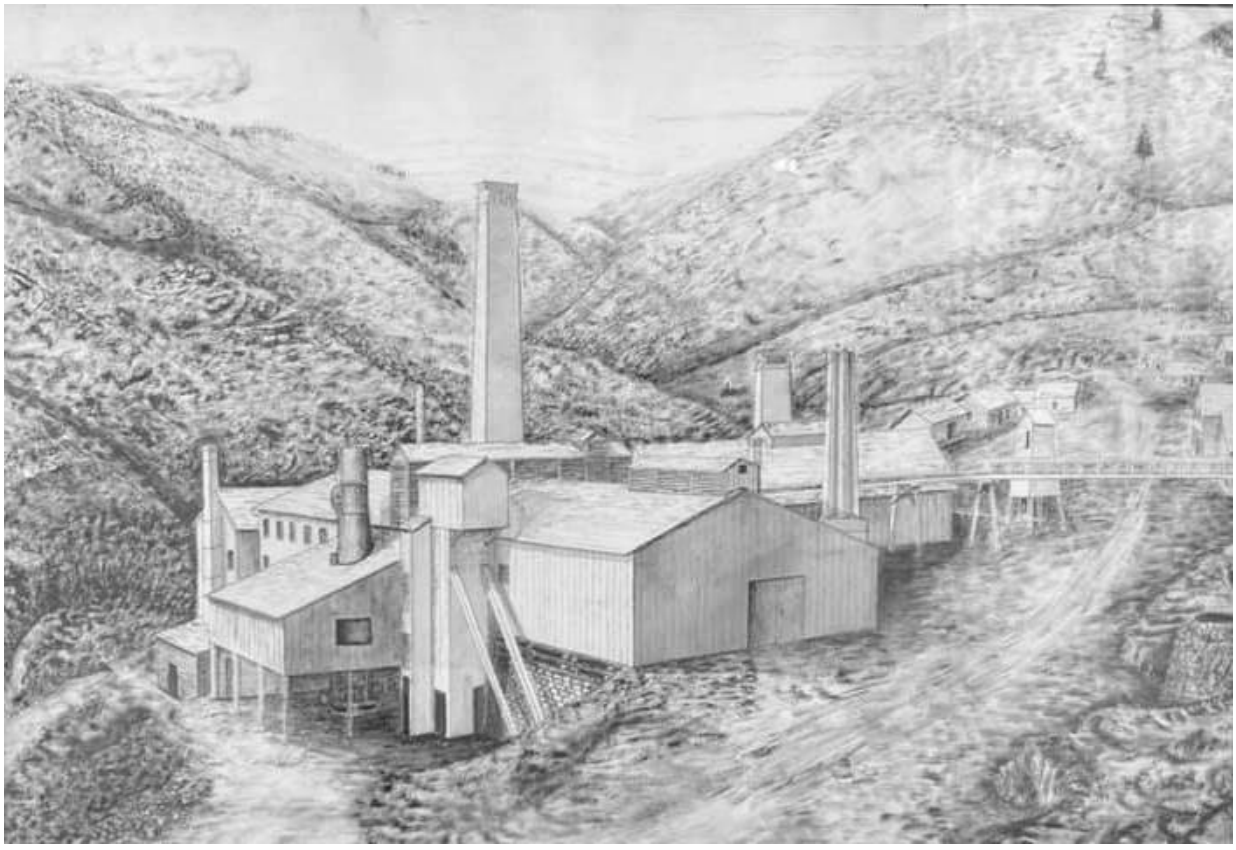
H. F. Brown:

Mining Engineer, Disaster Magnet and Artist

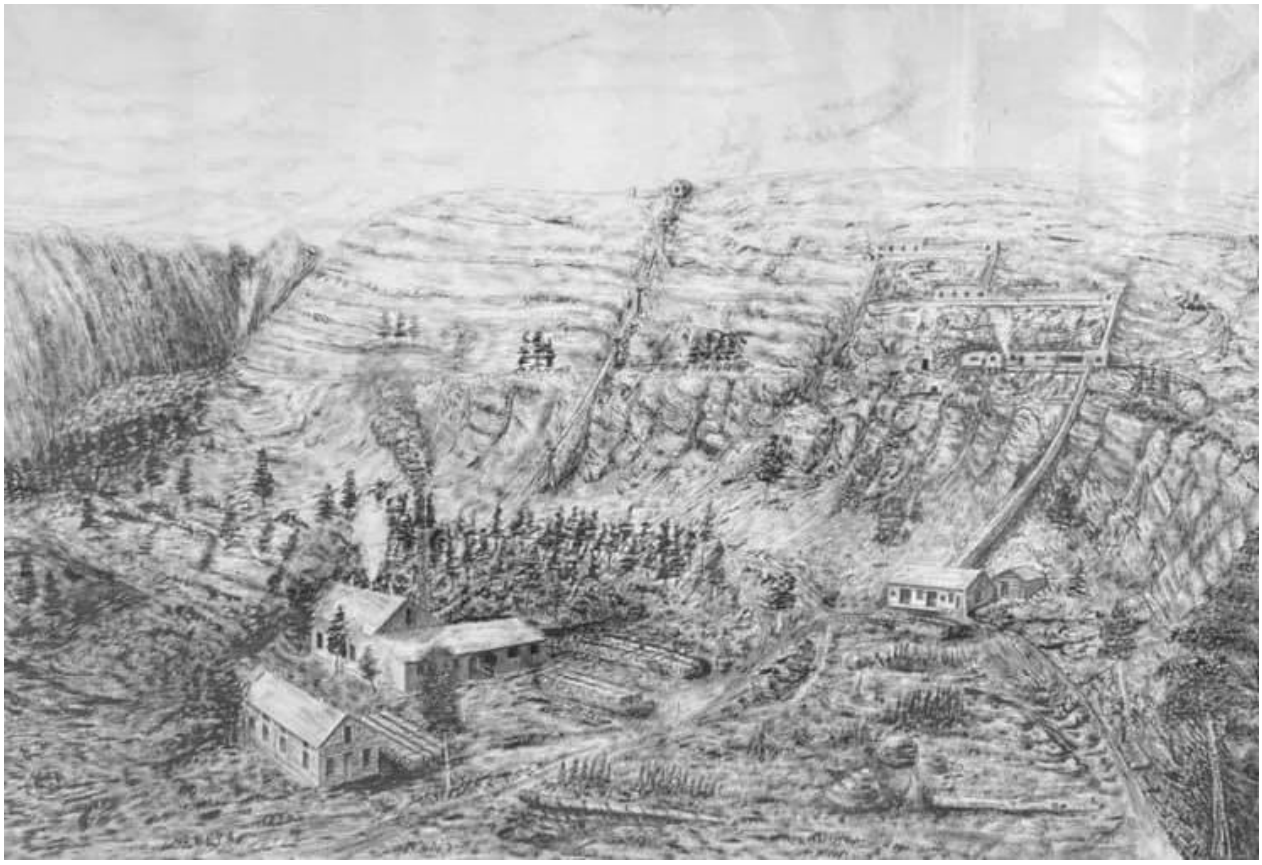
Dustin Schillinger

Late last year I was contacted by my friend David Perlstein about two charcoal sketches that were in the collection of Stuart McKenzie. As many of you know, Stuart passed away last year, and with him went an irreplaceable amount of knowledge and passion about Montana history and documents. Two pieces which he coveted where these drawings. Shown in these large sketches are the Hecla Consolidated Mining Company smelter at Glendale Montana, and the mining works on the side of Lion Mountain at Hecla. David was able to purchase these on my behalf to add to my mining and Montana history collection.



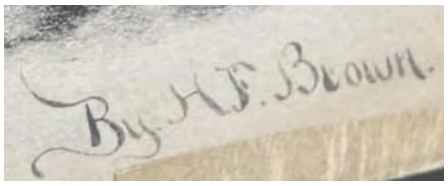
Hecla Consolidated Mining Company smelter at Glendale, Montana

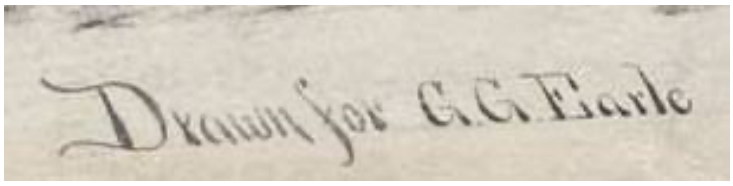
Once again, David was able to let Stuart know that the drawings were go to another "forever home" at our house and so they stayed in Montana where they are appreciated the most. As always, I was curious about the drawing's history, artist, and age. With Stuart passing away, I felt it was even more important to document what these pieces of paper that he felt were so special really were.



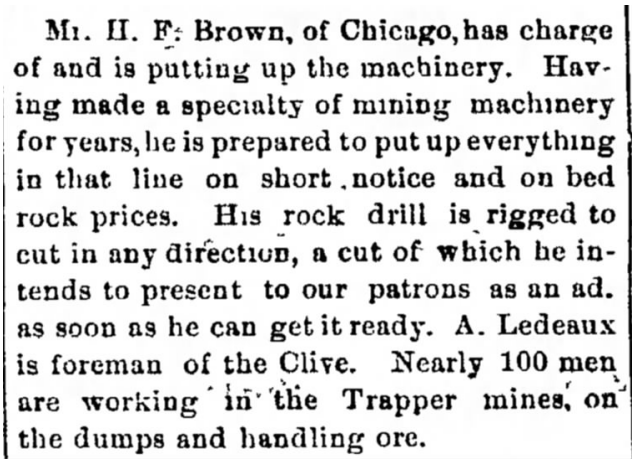
HECLA CON. MINES LION MT. MONTANA.

The artist signed one, H. F. Brown. With that, I dived deep into finding out who this man was, and let me say, it was a wild ride following this man's life! I am going to summarize this tale a bit, or this story would fill a volume. Although H. F. Brown had a very successful career and life prior to arriving in Montana Territory, I am going to focus on his years here, and all of his adventures, mishaps, and exploits. Note that the sketch above of the mines at Lion Mountain was drawn for G. G. Earle. The life of Mr. Earle is an entirely different road to travel on another day, but it is notable that G. G. Earle was the Superintendent of the Hecla Consolidated Mining Company smelter at Glendale. An article in the October 9, 1883, Butte Miner tells the story of 47 of Earle's former employees presenting him with a gold pocket watch and celebration. The watch was reported to be finely crafted and very valuable. The inscription inside said simply, "Presented to G. G. Earle by Smelter Boys".





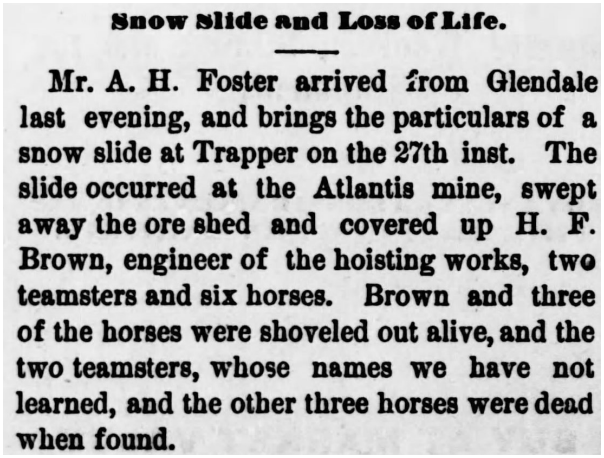
Horace F. Brown



Mr. H. F. Brown, of Chicago, has charge of and is putting up the machinery. Having made a specialty of mining machinery for years, he is prepared to put up everything in that line on short notice and on bed rock prices. His rock drill is rigged to cut in any direction, a cut of which he intends to present to our patrons as an ad. as soon as he can get it ready. A. Ledeaux is foreman of the Clive. Nearly 100 men are working in the Trapper mines, on the dumps and handling ore.

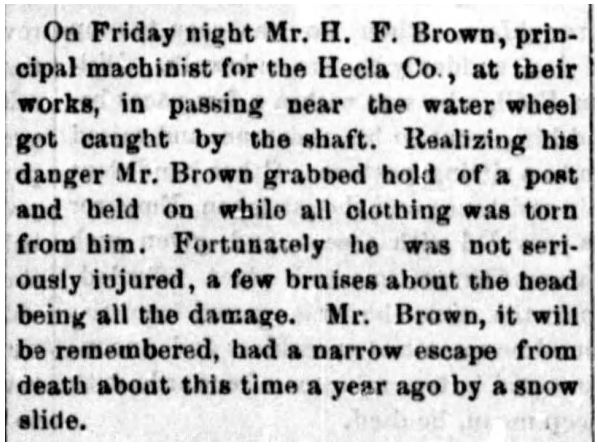
The first mention of Mr. H. F. Brown in Montana newspapers was on August 21, 1878. A "traveling correspondent" writing for the Helena Independent-Record visited the towns of Melrose, Divide, Glendale, Trapper City, and White Lion City to look over the properties of the Hecla Consolidated Mining Company. Brown was cited as being in charge of installing machinery for Hecla's New Atlantis mine on White Lion Hill [Mountain]. By this time the Hecla mines were very prosperous. They had just completed the installation of smelting furnaces at Glendale and added a 10-stamp mill to their reduction works. The company employed over 500 men in many different capacities. Small towns sprung up further along Trapper Gulch as mining, logging, and refining progressed. In 1878 alone, the Hecla Mines shipped 1,080,000 pounds of bullion worth $216,000 at the time. They also shipped 400,000 pounds of copper matte, according to the article.

The next mention of H. F. Brown's time in Montana comes in February of 1879. A large slow slide occurred at Trapper City, near the base of White Lion Mountain. Several avalanches had plagued the town and mining operations over the years, often making the area inaccessible for several months of the year. The slide occurred on the 27th of January. It swept away an ore shed and buried H. F. Brown, two other men and six horses. Men frantically shoveled away the snow and eventually found Brown and three of the horses alive. This was to be the first of Brown's many brushes with death in Montana.



Snow Slide and Loss of Life.

Mr. A. H. Foster arrived from Glendale last evening, and brings the particulars of a snow slide at Trapper on the 27th inst. The slide occurred at the Atlantis mine, swept away the ore shed and covered up H. F. Brown, engineer of the hoisting works, two teamsters and six horses. Brown and three of the horses were shoveled out alive, and the two teamsters, whose names we have not learned, and the other three horses were dead when found.



On Friday night Mr. H. F. Brown, principal machinist for the Hecla Co., at their works, in passing near the water wheel got caught by the shaft. Realizing his danger Mr. Brown grabbed hold of a post and held on while all clothing was torn from him. Fortunately he was not seriously injured, a few bruises about the head being all the damage. Mr. Brown, it will be remembered, had a narrow escape from death about this time a year ago by a snow slide.

In January of 1880, The New-Northwest newspaper of Deer Lodge published a story in which Brown danced with danger once again. While acting as the Hecla Company's principal machinist, Brown walked past a moving water wheel and was caught by the rotating shaft. Knowing he was in trouble, Brown grabbed a support post and held tight. His clothes were torn off and he sustained "bruising about the head" as a result. The article reminds readers that Mr. Brown had narrowly escaped death in the snow slide just a year before.

—Mr. H. F. Brown, for several years master mechanic ot the Hecla mines at Glendale, has accepted a similar position at the Alta Montana Company's works, at Wickes. The company is to be congratulated on having secured the services of so valuable a man.

In August of 1880 H. F. Brown resigned from Hecla Company amid rumors that the mining company was to be sold. He didn't wait long to find a new adventure and took a position with the Alta Mining Company in Wickes. Prior to coming to Montana, Brown had worked for the Frasier & Chalmers Co in Chicago as an engineer and had designed the smelting furnace that was installed in Glendale. Seeing how well the furnace worked on Hecla's ore, the Wickes Company immediately ordered an exact copy for their works at Wickes. When it arrived, Brown put it together and had it operating withing 10 days. It seems that his quick turnaround in finding a job may have been months in the works. In May 1881, disaster struck again for Brown when the drying furnace caught fire at the Alta works. Within an hour, several buildings were burned to the ground. 150 men were out of work and the operation was at a standstill. He inspected the machinery and felt it could be saved. He immediately began reconstruction which would cost over $200,000 dollars. Sadly, the company had only insured the property for $75,000. While working in Wickes, he did a crayon sketch of the reduction works.

A GREAT DISASTER.

Works of the Alta Montana Company at Wickes Burned.

H. F. Brown, the Superintendent, will go to work at once, and it is believed that he will have the smelter in runing order within the next ten days, and it is also believed that the entire works will certainly be ready to resume operations during the present season. In the meantime the concentrating works put up by the Company last fall and set to work this spring at the Comet are in first class condition, running successfully, and until the other works can be put in operation will be able to furnish ore sufficient to keep the smelter running. As the smelter will be running again within the next ten days the production of bullion will thus go on with but slight interruption.

A Handsome Picture.

An important addition was made to the ornaments of the HERALD sanctum this morning, consisting of a large and well executed picture of the reduction works of the Alta Montana Company at Wickes. The photograph was taken from a crayon sketch made by Mr. Horace F. Brown, of Helena.

Helena Weekly Herald, November 2, 1882

By 1883 H. F. Brown had once again moved along. At this point the reason was unknown, but it will be revealed later in the story. For his next adventure Brown moved to Missoula. He and A. J. Urlin formed the Montana Lumber Company and built a two-story mill complete with planing machines run by a 40-horsepower steam engine. But Mr. Brown was an accident waiting to happen. In May of 1883 bad luck struck Brown again when he was pinned under the engine he was setting in place at the sawmill. Brown received a dislocated shoulder, and "extensive damage" to his right ankle and knee. If that close call wasn't enough, fire once again put Brown's life at risk. In August of the same year the same engine that pinned him caught fire. Brown was living at the sawmill and was asleep when the fire broke out in the engine room. Brown's Newfoundland dog woke him up, but at first Brown did not see anything wrong. The loyal dog persisted, and Brown went to inspect the works and discovered the fire. He quickly put it out. Had he continued to slumber the entire mill and his living quarters would have been

HISTORY OF MONTANA.

An Enterprise of Merit Inaugurated.

Mr. H. F. Brown, artist, arrived from Bozeman a few days since and is engaged in sketching for Stewart's History of Montana, a quarto volume of 1,200 pages which Mr. Stewart and a corps of artists and writers are now compiling. The scope of the work will be extensive and the numerous lithograph illustrations with which it is designed to embellish it will make the work attractive as well as useful. It is the intention to take up in this volume as much of the early unwritten history of Montana as possible, and to supplement this with full statistical information from the Territorial and county records. The illustrations will include all public buildings of note, grouped to precede the sections devoted to the several counties and to the Territory. It will also contain views of private buildings and farms, and biographical sketches of prominent pioneers, illustrated with portraits. It is not possible to overestimate the desirability of getting now into imperishable print the early history of Montana locked up in the memories of a dozen or two men who one by one are dropping out of Life and carrying with them knowledge it will after their death be impossible to obtain. The Montana Historical Society has done something, all it could, in this direction, but its funds have been too meagre to do what it should. Incidentally we urge upon the Legislature to appropriate a year's salary to a good stenographer whose duty it shall be to interview thoroughly such old-timers as the Historical Society may designate, and file with it a transcript of his notes.

Pending this, the work of Mr. Stewart, which it is designed to issue by mid summer, is worthy of encouragement. Mr. Stewart has followed this business for the past fifteen years and has published some fifty different volumes of county history from Maine to California. His experience justifies good anticipations. He has now two artists in the field and will soon have a third, while he and assistants look more particularly after the historical matter. Mr. Brown was in '78-'80 mechanical engineer of the Hecla works at Glendale, rebuilding them after the fire, and was in '80-'82 employed in like capacity at Wickes. Having been incapacitated for that service by mineral poisoning he has engaged in this work and his practical knowledge of Montana will greatly aid him in collecting material. We wish the enterprise success.

reduced to ash. In January of 1884 it was reported in a Helena newspaper that Brown had sold his interest in the Missoula operation and was coming to Helena to stay! But we know that couldn't possibly be true, Horace F. Brown was a man on the move.

Now peacefully living in Helena, Brown needed something to do. He had lived a lifetime in the few years that he was in Montana Territory, not to mention his highly successful mining engineering and inventing career that took place before he ventured west. In an article dated January 12, 1883 published in the New-Northwest Newspaper, Brown's arrival in Deer Lodge, MT was announced. But this time it wasn't mining or engineering he was doing, it was drawing.

D. J. Stewart of Anamosa Iowa had written over 50 county histories from the East coast to the West coast when he decided to take on the project of documenting the history of Montana Territory. His prospectus and pre order solicitation issued in 1880 stated that the book would be 600 pages long complete with sketches that were "replete with incident." In 1882, Stewart hired H. F. Brown to travel throughout Montana and complete sketches of some of the more notable towns, landscapes, and enterprises. Also, in this article the reason for H. F. Brown leaving his job as the Superintendent of the Alta – Montana Mining Company at Wickes was revealed. The article states that after working at Wickes from 1880-1882, Brown had become incapacitated due to "metal poisoning", and therefore was hired by D. J. Stewart to makes sketches for his project. Several small announcements were made in Montana towns of Brown's arrival to sketch scenes. His sketches of Diamond City, Wickes, Deer Lodge, and Bozeman were described as "handsome."

In 1883 Stewart died of pneumonia at Red Rock in Beaverhead County, leaving the project's completion in question. An article in the Billings Daily Herald from April 25, 1883, announced that H. F. Brown would continue on and complete the work of the late D. J. Stewart. What happened next is unknown, but eventually the project was taken over by M. A. Leeson (Leyson) and the book was expanded to over 1400 pages. The "History of Montana 1739-1885" was published by the Warner, Beers, & Company in 1885. Today this book remains a valuable reference to the early days of Montana.

1884 and 1885 seem to have gone well for H. F. Brown. He returned to Helena and continued work on his patent for an improved smelter system. Several articles appear from around the area with opinions and examinations of mining districts. Brown visited Pony, Neihart, Wickes, Diamond City and Comet.

While Brown was at the Drum Lummon Mine in Marysville, 75 pounds of Giant brand explosives exploded at the entrance to the Cruse Tunnel killing one man. Brown called the Helena Weekly Herald by telephone to report the incident. Sometime during 1885 Brown went to work for the Helena Iron Works foundry. They specialized in castings, rock crushing machinery, and car wheels. All of which were perfected under the supervision of H. F. Brown the renowned engineer. In a theme that seems all too familiar with Brown, an accident was lurking. On April 22, 1886, the Helena Weekly Herald reported that Brown, the Superintendent of the Helena Iron works was injured when a piece of flying metal struck him in the face. The force was strong enough to break the lens of Brown's spectacle and fill his right eye with broken glass. But, with the use of cocaine an operation was performed and H.H. Wynne Oculist and Aurist said that he expected Brown to make a full recovery.

Powder Explosion.

By telephone to H. F. Brown from Marysville, we learn that the powder magazine of the Montana Company, Limited, which was situated at the mouth of the Cruse tunnel at the Drum Lummon mine, had exploded about noon to-day. From other sources we learned the following particulars: Shortly before noon to-day a box and a half (75 lbs.) of giant powder exploded accidentally at the mouth of the Cruse tunnel, killing one man, named John Ford, and blowing him to atoms. Parties telephoned to at Marysville are disposed to be non-committal on the subject until after the inquest, which will be held this afternoon, and we could obtain no further particulars.

District Court.

Brown spent much of the later part of 1886 and the beginning of 1887 inspecting mining prospects for investors. Brown's engineering and ore processing knowledge where very useful in this endeavor. Several articles once again appeared announcing the arrival of Brown along with investors looking at mining claims and properties throughout central and western Montana. Brown's big move in 1887 was undertaking the development of the coal mines at Cinnabar, MT that were owned by Harry Horr and several investors from Butte and Helena. Given Brown's early experience in coal mining and producing coke, this seemed to be the perfect opportunity for him. He was quoted as saying that the coal veins were large and would produce enough coal to supply the entire territory's needs. He designed and oversaw the construction of several coke ovens at Cinnabar, some of which remain today. H. F. Brown placed an ad in the December 1, 1887 Livingston Enterprise newspaper looking to hire 40 to 50 miners to work at the mines operated by the Park Coal and Coke Company. The ad said miners would be paid $1.20 per ton. The ad also lists Brown's address as Gardiner, MT.

Laborers Wanted.

Horace F. Brown, manager of the Horr coal mines, writes us that owing to a largely increased amount of orders he wants a force of 40 or 50 miners, to whom he will give steady work. Apply in person or address Horace F. Brown, Gardiner, M. T. He is paying $1.20 per ton for mining.

In August of 1889 Brown returned to Livingston from a trip to Butte with a load of coke for W. A. Clark's smelter. The coke was found to contain too much silica and unsuitable for use by Clark or the operators of the Parrot Smelter. The decision was made to set up a washing and concentrating plant to purify the coke. This was a major blow to the company and all the miners and laborers except those operating the coke ovens were discharged. Not much else appeared discussing Brown's involvement with the Park Coal & Coke Company, but the mines continued for many years and spawned the towns of Horr, Electric, and Cinnabar to be settled.

Brown was once again on the move and beginning another endeavor in 1890. This certainly may have resulted from the coke debacle the year before that shut down the mining operations in Cinnabar temporarily. An article in the April 29, 1890, Anaconda Standard stated that Brown had recently acquired the Lexington Foundry in Butte. The existing foundry was located on leased ground with the lease ending in July of that year. The property was deemed too small for the type of operation Brown wanted to construct, so he bought a large tract of land near the Northern Pacific Railroad yards to build on. Brown said he planned to erect a 70 foot by 200-foot machine shop at the cost of $100,000. Brown placed an ad in the Butte Daily Post in August of 1890 to announce he would be accepting bids for the construction of his operation. The new foundry would be called Western Iron Works and include pattern shops, a foundry, machine shops, and fabrication works. A certificate of incorporation had been filed in February of 1890 by Brown, Jared E. Gaylord, and Wallace D. Pinkston listed as officers. In 1891 Brown was granted a patent for his ore roasting furnace invention. What happened next is unknown, Brown's name disappears from letterheads and articles involving the Western Iron Works around 1892. In 1894 Wallace Pinkston was arrested in Missoula for embezzling $15,000 from the Western Iron Works where he had replaced Brown as the General Manager. The business continued for over a century and a portion of the original building is still standing, and still in use as a metal fabrication and machinery repair company.

IT WILL BE A BIG AFFAIR.

Preparations Being Made for Erecting a Large Foundry in Butte.

By the Standard's Special Wire.

BUTTE, April 28.—H. F. Brown, who recently came into possession of the Lexington foundry, has found it necessary to increase his plant. The ground upon which the works are located is leased by him, the lease expiring some time in July. As the ground is too small to allow the erection of such works as Mr. Brown has in contemplation, he decided upon a new location and purchased a large tract of ground near the Northern Pacific yards. Some idea of the extent of the new plant can be formed when it is stated that it will cost fully $100,000 and, and with the necessary yard room, will cover about two acres of ground. The machine shop will be 70x 200 feet and a foundry of the same dimensions will also be erected. Both buildings will be equipped with the very latest and best machinery and appliances in use in those particular branches. Besides these two immense buildings, a pattern room and boiler shop of proportionate dimensions will also form a a part of the plant. Work on the buildings will begin in a short time, as soon as a few preliminaries in connection with the ground are completed.

LOCAL ENGINEER DIES IN EAST

HORACE F. BROWN, INVENTOR OF COAL MINING MACHINE, ETC., PASSES AWAY.

Horace F. Brown, a well-known mining engineer, residing at 130 Ninth street, this city, and manager of the Pacific Engineering Company of San Francisco, died suddenly of heart failure last Sunday evening in Chicago.

Mr. Brown had but recently left San Francisco on a business trip and the end came most unexpectedly while he was visiting his niece, Miss Inez Verplank, of 3035 Prairie avenue.

The body was taken to the family home in Chicago by N. Sherman Carson, son-in-law of the dead man.

The deceased leaves a widow, Mrs. Mary Brown, who resides at 130 Ninth street, Oakland. She is at present, however, at the home of her daughter, Mrs. W. D. Pinkston, 1440 East Sixteenth street. Another daughter, Mrs. W. Sherman Carson, resides in Chicago.

Mining engineers who knew him regarded Mr. Brown as the originator of the first successful coal mining machine. Among other inventions which have gained for him prominence are a [illegible]n of ore furnaces, the first successful water jacket smelting furnaces and working kilns for making carbonic gas from lime rock by heat instead of by use of acids and marble dust.

Coming to California in the early days of the gold fever, Brown eventually drifted to Butte, Mont., where he organized the Western Iron Works corporation. At his death he was manager of the Pacific Engineering Company of San Francisco.

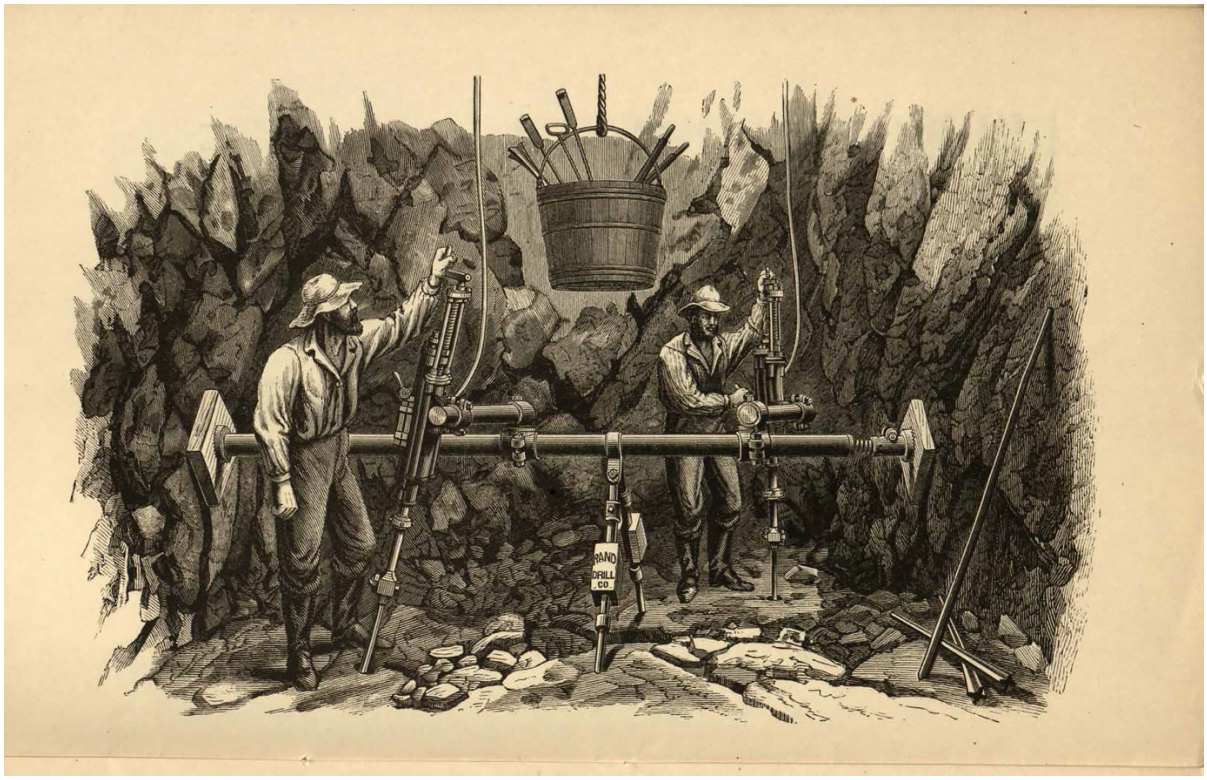
The last item I could find on H. F. Brown that was published in Montana was his obituary. On April 16, 1906, while doing business in Chicago, he died of sudden heart failure. He was 66. His body was returned to Oakland, California where he had been living since 1901 while employed as the general manager of the Pacific Engineering Company. He left behind his wife, three daughters, and a son who was stationed as a surgeon in the Philippines.

I found several articles in mining and engineering publications announcing Brown's death. He had accomplished a great deal before his story even began in Montana Territory. As you have read, he was involved in several aspects of the early days of mining and ore processing in Montana. His inventions, businesses, and exploits were numerous. It is amazing to have these two drawings that were done by his hands hanging on my wall.

The Rand Drill Company

Doug Miller

The illustration below is from an 1880s catalogue in the digital collections of the Hagely Museum and Library in Wilmington, Delaware. It pictures the Rand "Little Giant" Rock Drills.



The catalogue was published in 1881 by George H. Sampson of Boston, Massachusetts, New England agent for Atlas Powder Company and Rand Rock Drills. The catalogue also advertises powders and blasting machines sold by Laflin & Rand Powder Co.[1] Two collectors asked whether Rand Drill Company was related to Laflin & Rand Powder Company or to Ingersoll Rand. The answer to both questions is "yes".

History of the Rock Drill[2]

The rock drill was an American invention. J. J. Couch of Philadelphia took out the first practical patents in 1849. He was assisted by Joseph W. Fowle. Fowle later parted ways with Couch and, in a separate filing in 1849 covering his own invention, described a successful power rock drill in which the drill was attached directly to the piston rod. Fowle didn't have the financial means to develop his invention, and it remained undeveloped until Charles Burleigh purchased Fowle's patents and produced the Burleigh drill in about 1866. The drill was used in driving the Hoosac Tunnel in Massachusetts in 1867.

Early in the development of rock drills, brothers Addison C. and Jasper R. Rand also became interested in rock drills as a result of their association with Laflin & Rand Powder Company.

Laflin & Rand Powder Company was organized on August 24, 1869, under the laws of the State of New York. Its purpose was to acquire the properties of several successful powder companies. The mills acquired by the new company had been in existence for a long time and had been highly successful. In August 1871, the executive committee of the company reported that the New York legislature had passed a special act conferring on the company the right to own stock in any company connected with or auxiliary to the manufacture of explosives.[3] In that same year, Addison Rand formed the Rand & Waring Drill and Compressor Company for the manufacture of steam percussion drills used in mining. Addison Rand held 25% of the stock of the powder company and 45% of the stock of this concern. He later gained complete control of the Rand Drill Company.

J. C. Githens was superintendent of the Rand Drill Co. He invented the "Little Giant" rock drills pictured in the illustration from the 1881 catalogue. Githens was the originator of many improvements which made the use of the rock drill in mining and tunneling practical.

At about the same time, the Ingersoll drill was invented in 1871 by Simon Ingersoll, an ingenious mechanic. He moved to New York City from Connecticut, bringing with him models for several inventions. Ingersoll's conversation with another passenger in a New York horse car about his invention of a rock drill was overheard by John D. Miner. Miner was a contractor who had been employed to do some excavation work in New York City. Miner's men could only drill about one ten-foot hole a day using their hand tools. When asked, Ingersoll told Miner that he couldn't see why a machine could not be made to do the drilling. Miner gave Ingersoll $50 toward the building of a rock drill. Ingersoll's first drill was built in a shop owned by J. F. de Navarro and managed by Sergeant & Cullingworth. Henry C. Sergeant walked into the shop one day and saw Ingersoll's prototype. He noticed that the front head was attached to the cylinder. He told the workmen to cut it into two pieces in order to make it work better. When Ingersoll walked into the shop, they had done so before Ingersoll could stop them. Ingersoll and Sergeant quarreled, which led later to Navarro, on Sergeant's advice, buying all of Ingersoll's patents. Navarro organized the Ingersoll Rock Drill Co. which, after a dispute with Burleigh, who owned the rights to Fowle's work, became the sole owner of Ingersoll's patents. The Ingersoll drill was manufactured by Sergeant & Cullingworth and sold by Ingersoll Rock Drill Co. Sergeant later sold his interest in the firm because of friction with management, moved west, engaged in some mining, then returned to New York in 1885, and organized the Sergeant Drill Co. The Sergeant Drill Co. and the Ingersoll Rock Drill Co. were later merged into the Ingersoll-Sergeant Drill Co. In 1905, the Rand Drill Co. was merged with the Ingersoll-Sergeant Drill Co. to form the Ingersoll Rand Company. As noted by W. L. Saunders in his 1910 article on "The History of the Rock Drill,"

> "The Rand drill from the beginning had been the most formidable competitor of the Ingersoll and Sergeant types. The conjunction of the Ingersoll, Sergeant, and Rand companies, therefore, was a combination of valuable patents in rock drills, compressors, and general machinery for mining, tunneling, and quarrying. Each shop received the benefit of the experience of all the others and the best features of the Ingersoll, Sergeant, and Rand types were taken to make an improved product."[4]

Eric Twitty, in his excellent book, *Blown to Bits in the Mine*, discusses the history of rock drilling at length.[5] He concludes:

> "The impact that rockdrills had on labor was great, creating demand for miners with expertise in using and maintaining them efficiently. But the drills also accelerated the demise of many miners by creating the ideal conditions for silicosis. Through the twentieth century rockdrills became smaller, faster, safer, and more efficient. The ultimate result of the development of rockdrills between the 1870s and 1950s was improvement in the mine as a work environment, mechanizing what once brutal, slow hand-labor, and speeding the blasting process, which meant greater production for the minerals industry."[6]

End Notes

[1] Sampson, George H., *George H. Sampson's New England Agency for Gunpowder for Sporting and Blasting*, 1881. https://digital.hagley.org/I091111_samp?solr_nav%5Bid%5D=7c81b2faa744f926e11d&solr_nav%5Bpage%5D=0&solr_nav%5Boffset%5D=0#page/1/mode/2up, accessed September 26, 2021.

[2] W. L. Saunders, "The History of the Rock Drill," *Mines and Minerals*, August 1910. https://books.google.com/books?id=So85AQAAIAAJ&pg=PA18#v=onepage&q&f=false, accessed September 26, 2021.

[3] Arthur Pine Van Gelder and Hugo Schlatter, *History of the Explosives Industry in America* (New York: Columbia Universtiy Press, 1927), 219–21.

[4] W. L. Saunders, "The History of the Rock Drill," 18–19.

[5] Eric Twitty, *Blown to Bits in the Mine: A History of Mining & Explosives in the United States* (Lake City, CO: Western Reflections Pub. Co., 2009), 37–55.

[6] Twitty, 55.

Saxon Mining Collectibles

Wendell Wilson

Saxon mining collectibles of various sorts provide an evocative background to the classic minerals of the Saxon Erzgebirge mining district, and are prized historical display items for many mineral collectors as well as collectors of mining memorabilia and antiques.

INTRODUCTION

The Saxon Erzgebirge ("Ore Mountains") and nearby metal mining districts have a long and illustrious mining history spanning many centuries. During that time the miners and their families developed unique traditions, tools, lighting devices, apparel and folk art which today make interesting and evocative collectibles. These are the same miners who retrieved the many classic mineral specimens, especially silver minerals, for which the former kingdom of Saxony is justly famous—specimens that are highly treasured by mineral collectors and museums today. Saxon mining collectibles make fine display objects that help us form a connection with the miners of old, and thus a deeper appreciation of the mineral specimens that they so carefully preserved.

Figure 1. Early Saxon mining officials in full regalia.

Eagerly collected categories of Saxon mining memorabilia include complete miners' uniforms, hats, parade swords, fanny- packs (Tscherpertasche), rear apron (Arschleder), knee-protector (Kniebügel), pedestal-mounted sculpture made of minerals (Hand- stein), miners' occupational beer steins (Bierkrug), wood, pewter, bronze or porcelain miner statuettes, miniature mining machinery models, and many others. Only the following three categories will be dealt with in this article: the Saxon miner's axe, the frog lamp and the blende lamp.

Figure 2. Title page and frontispiece of Andreas Moller's Theatrum Freibergense Chronicum ("History of the Town of Freiberg") (1653).

THE SAXON MINER'S AXE

For many centuries in Saxony, parades have been held on special occasions in which the miners would march in their best finery, wearing hats characteristic of their rank and mining area, and carry- ing mine lamps and the special miner's axe called the Bergbarte (plural: Bergbarten)—not to be confused with the Berghäckel or Steigerhäckel, which was more like a walking stick with a much smaller axe-head or hammerhead used as a handle.

Silver mining in the Freiberg area of the Erzgebirge began in 1168, and the Saxon miner's axe was developed sometime thereafter as a distinctive miner's weapon. Unlike rural poor who were born into serfdom, miners were free men allowed to bear arms because the silver mines might need to be defended from invaders and thieves. The sovereign might also require the miners' services in time of war.

Figure 3. Nineteenth-century postcard photo of a miner in early 17th-century dress. Günter Grundmann collection.

The Saxon miner's axe was probably derived originally from a Frankish hatchet called a francisca. The Bergbarte had a com- bination hatchet-like blade and a long pike designed for stabbing like a bayonet—a formidable weapon similar to the halberd. By the mid-16th century these had evolved into a purely ceremonial form carried in miners' parades. The design is definitely derived from a weapon and is unrelated to the simple, utilitarian form of the timberman's axe that was used to cut and trim mine timbers. In contrast to the simple timberman's axe, the miner's Bergbarte typically showed a significant amount of artisanship.

Figure 4. Saxon mining antiques including two 17th-century Bergbarten ("miners' axes"), two 18th-century Froschlampen ("frog lamps"), a Freiberger Blende ("Freiberg niche lamp"), and a Tscherpertasche (miner's fanny pack). Oil painting by the author, of items in his collection.

It is interesting to note that an electoral order published by the city council of Freiberg on April 9, 1532, banned miners from carrying "mine axes and other deadly weapons" on holidays. Apparently these weapons were typically carried on the street as proudly as a Spaniard or a Frenchman might carry his sword. Andreas Möller, in his Theatrum Freibergense Chronicum ("History of the Town of Freiberg") (1653), reported that: "In the year 1557, On December 16, the newly elected King of Denmark Fridericus II came to visit Freiberg with his brothers and cousins. The whole citizenry was summoned and the council members and mining officials gathered in great numbers, dressed in their garb, with their mine axes in hand, to welcome the dignitaries." An edict of 1693 dictating the proper parade wear stated that "Miners shall be in their miner's garb and bear no other weapon than the axe."

Who made these weapons? The craftsmen responsible no doubt lived in the mining towns and villages of the Erzgebirge; they were probably members of the mining guild, miners or invalids; even today retired miners sometimes earn extra income as wood carvers and amateur craftsmen. Naturally, blacksmiths, weapons makers and cutlers must have contributed in the production and decoration of blades.

It can be deduced from the years inscribed on some of the axes that many were specially made for parades held for visiting royalty and for festivities in the electoral family. On these special occasions it was appropriate to obtain a beautiful new parade axe to carry in the parade. Such showpieces became heirlooms that were the pride of the miners' families for generations thereafter in Johanngeorgen- stadt, Schneeberg, Annaberg and Freiberg. The axe embodied their

pride of rank and their pride in being part of the miner's profession. Some axes have been handed down for many centuries in the same family. Little wonder that the owners of these beautiful antiques are reluctant to part with them even today, despite tempting offers from museums, collectors and dealers.

All Bergbarten, regardless of the mining district of origin, have a consistent basic form. The strong handle is a bit thicker toward the lower end and is either oval or circular in cross-section. The front edge of the axe-shaped blade extends upward in a spike, the point of which is usually crowned with an acorn-like protector (probably for safety). The blade is typically wrought iron, although axes from tin-mining districts are often made of tin, and a very few axes were made of brass.

Figure 5. Saxon miner's axes on display in the Deutsches Museum in Munich: three Bergbarten and two examples of the walking- stick-style Berghäckel. Wendell Wilson photo.

Generally the upper edge as well as the lower posterior edge has three (rarely four or five) small circular holes and a larger, usually clover-shaped (very rarely cross-shaped or key-hole shaped) hole cut into the center of the face of the blade. The cloverleaf ("trefoil") is an ancient Germanic symbol, an emblem of good luck and the blessings of happiness and power to the owner. The blades may also show the hallmark of the forge where the craftsman worked.

Figure 6. Three 17th-century Saxon miner's axes, one with an ivory- inlaid wooden handle and two with staghorn handles. Staatliche Kunstsammlungen Dresden collection; Jürgen Karpinski photo.

The following construction styles are known:

(1) Simple, undecorated wooden handle with an engraved ivory end-section. Some of these axes have 17th century dates inscribed on them.

(2) Wooden handle with carved illustrations but no inlays.

(3) Wooden handle inlaid with bone or staghorn. This type (called an Einlagenbarte) was most common in the Freiberg district but was also carried occasionally in other districts of the Erzgebirge such as the Annaberg and Schneeberg districts. The inlays are usually engraved scrimshaw-style with various scenes and designs. Numerous smaller circular inlays surrounding larger inlays can give a polka-dotted appearance. The wood used was usually oak, plum, ash or beech that was stained brown. In rarer cases, axes (called Zainbarten) carry additional ornamentation made from brass wire inlays.

(4) Bone or staghorn handle, assembled from closely fitted sections held together by an iron rod core. This style is called a Röhrenbarte, and is generally decorated liberally with scrimshaw- like engravings.

(5) The grand axes (Prunkbarten) carried by the highest-ranking mining officials. The handles of these axes may include elaborately engraved gold-plated inlays, and the blades (some in solid

silver or gold-plated silver) often feature enameled illustrations of the Electoral or Royal Polish crest. The axe that was part of the Elec- tor of Saxony's own parade outfit was studded with jewels from one end to the other.

Figure 7. Fifteenth-century Freiberg miner's ceramic oil lamp (Tonschalenlampe) with thumb- hole for carrying. The invention of a bail and hook connected through the thumb-hole resulted in the frog lamp design. Stadt- und Bergbaumuseum Freiberg collection; W. Rabich photo.

Most axes are richly decorated with pictorial illustrations. Mostly human figures and animals are pictured, rather crudely drawn but with the charm of folk art lacking any scholarly pretensions. The most popular illustrations include the electoral crest (usually at the end of the handle), the crossed hammer and chisel miner's symbol, Electoral Princes on horseback, portraits of Electoral Princes, min- ing officers, elders of miner's unions, miners at work with hammer and chisel (drilling, hauling, ascending and descending), dowsers and mining musicians.

Religious illustrations are also common, including God the Father, Christ, angels, evangelists, prophets, etc. But also entire groups or scenes were depicted: e.g., Nativity, Adam and Eve with the snake (the Fall of Man) and others. Tobacco-smoking miners with pipes similar to Dutch clay pipes are depicted on an axe dated 1690. Flowers, especially stylized tulips, were very popular. Some axe handles are decorated with bible verses, lyric verses, and miner's sayings. Above all, the handle of every complete axe—and this an essential component for proper style—must display a crucifix at the neck. Praying miners and often angels—in the form of the well- known wood carved, crowned Erzgebirgian Christmas angels—must kneel before the crucifix.

As the Saxon miner's axes have become more coveted by muse- ums, collectors and dealers of antiques, the prices have reached considerable heights. Unfortunately fake or reproduction mining axes also exist and may be sold as originals. So it is wise to work with a knowledgeable dealer. Borchers (1912) commented on the prevalence and quality of such fakes being circulated over 100 years ago:

Unfortunately, objects of the venerable Erzgebirgian mining art, which are right now, at the time of the decline of the Erzgebirgian mining industry, in high demand from museums and collectors, are being faked in profit-seeking schemes and sold to collectors. Especially mining axes (Bergbarten) are among those faked objects. The imitations, however, are not well executed. In most cases, fresh and often still fatty cattle bones are used instead of staghorn as in most authentic old axes. The illustrations of mining, machines and tools on these imitations is

often completely wrong. Even if the engravings of the craftsmen who produced the authentic old axes are simple and naïve, they are technically correct down to the smallest detail.

SAXON FROG LAMPS

Frog lamps (Froschlampen) are miners' oil lamps with a half-bail, hook and shield; the earliest examples date back to the mid-16th century. They evolved—possibly in the Annaberg area of Saxony, where the earliest known example is dated 1529—from ceramic open-pan lamps having a hole for the miner's thumb. The innova- tion was to attach a metal half-bail through the thumbhole and a hook from which the lamp could be hung. Almost from the start it appears that the half-bail carried a triangular shield at the top. The hook had a characteristic shape with an up-turned point that might be driven into a mine timber. It is secured into the top of the half- bail by an acorn-shaped button. A small shovel or scoop (Molle or Dochtbleche) was usually attached by a chain, and used for moving around the thick tallow fuel (Unchlitt) so as to keep the wick fed.

Figure 8. Copper frog lamp dated 1746 on the shield. Stadt- und Bergbaumuseum Freiberg collection; W. Rabich photo.

The term "frog" lamp is probably an allusion to the squat, rounded shape of the original oil pans, but the toad in German folklore was a symbolic guardian of treasures and a metaphor for alertness, so there may have been a double meaning.

Figure 9. Copper and brass frog lamp with elaborate engraving and sculpted shield dated 1677. Stadt- und Bergbaumuseum Freiberg collection; Helmut Fiege photo.

The most common form of the shield on early Saxon frog lamps is more or less triangular. Beginning around 1610, the shield was topped by three crosses symbolizing the Holy Trinity. Medieval miners were highly religious, and probably figured they could use every bit of divine protection that could be conjured. In some cases the oil pan carried religious inscriptions or incantations. A 1594 example in the Kreismuseum in Zwickau, Saxony carried the inscription (in German) "The blood of Jesus Christ the son of God cleanses us of all our sins." An example in the Freiberg Mining Museum, dated 1643, carries a similar inscription on the oil pan and a crude crucifix engraved on the shield with the letters "INRI" (an abbreviation for Iesus Nazarenus Rex Iudaeorum). Another fine example in the Freiberg Mining Academy carries a crucifix on the shield and also on the oil shovel. The engraving on the pan indicates that the lamp was presented to Balzer Rösler on New Year's Day of 1643 by Severin Adeler.

Figure 10. Brass frog lamp with elaborately engraved shovel and sculpted shield dated 1679. Deutsche Bergbau-Museum Bochum collection; Helmut Fiege photo.

Frog lamps from the Harz region had a shield with a scalloped top edge rather than three crosses.

The crossed hammers symbol (Schlägel und Eisen) of the mining profession is also a common marking on the shields, as are a pattern of four holes. In some cases the shield itself carries an engraved date and perhaps a further inscription. An example in the Bochum Mining Museum is engraved "Ge Chr L Schell Ernst August Stol- len 1864," commemorating the completion of the Ernst August water-drainage tunnel in the Harz Mountains on June 22, 1864; the other letters are an abbreviation for the name of the recipient, Georg Christian Ludwig Schell, a contract miner from Zellerfeld who had been involved in the construction of the tunnel.

The open-pan frog lamp was often used as a ceremonial object carried in parades long after such lamps were replaced by more modern forms of lighting. Ordinary frog lamps were typically made from iron, sometimes with a brass plate riveted to the shield as a space for engraving. Parade frogs and presentation frogs, on the other hand, are typically made of brass or bronze, and rare examples are known in copper or copper and brass. One extraordinary example was part of a complete miner's parade costume presented to the Saxon Elector Johann Georg II by the City Council of Freiberg in 1677. It is made of gilded silver from St. Daniel's mine at Schneeberg, and is encrusted with polished garnet, rock crystal, opal, amethyst and smoky quartz gems, all found in Saxony. The costume (including a similarly lavish Bergbarte) was the work of a famous Freiberg goldsmith named Samuel Klemm the Younger, and is preserved today in the "Green Vault" collection in Dresden.

Figure 11. Jewel-encrusted gilded silver frog lamp made for Saxon Elector Johann Georg II in 1675–1677 by the Freiberg silversmith Samuel Klemm. Staatliche Kunstsammlungen Dresden, Grünes Gewölbe collection; Jürgen Karpinski photo.

Figure 12. Early brass frog lamp dated 1607. Stadt- und Bergbaumuseum Freiberg collection; Helmut Fiege photo.

Possibly in response to the use of a thinner mineral oil for fuel instead of tallow, the open pan was enclosed in the 1860s to prevent the fuel from sloshing out. An opening with a slide lock was left for the wick to emerge from the oil pan, and instead of a Molle a tweezers on a chain was supplied for pulling up the wick. However, by this time the Freiberger Blende was already coming into use, and consequently the closed-pan Saxon frog lamps are comparatively rare, except for parade frogs.

Frog lamps for use in the mine were eventually replaced by the brighter carbide lamps in the early 20th century, and there is even a rare hybrid frog lamp designed to operate on carbide instead of oil, for those miners who just couldn't give up their frogs. Its rarity today attests to its failure to gain popularity.

Note: It is the shield that characterizes an oil lamp as a miner's frog lamp. Without the shield it is instead merely a "Betty lamp," of lighter construction and intended for household use.

THE FREIBERGER BLENDE

Figure 13. Freiberger Blende, late 19th-century, with spherical "coo-coo lamp" inside. Staatliche Kunstsammlungen Dresden, Grünes Gewölbe collection; Jürgen Karpinski photo.

Open-flame frog lamps were used for centuries in Saxony, but they had two major disadvantages: dripping water or high winds underground could extinguish them. Apparently these disadvantages were particularly acute in the mines of the Freiberg district, because it was there in the mid-18th century that an alternative was invented: a linden-wood box, lined with polished brass and open on one side, holding an oil lamp or candle protected both from falling water and wind. If conditions were particularly windy, a glass or muscovite window could be inserted to cover the open side, while ventilation holes admitted just enough air flow to provide oxygen for the flame. This kind of lamp is called a Freiberger Blende. The German word Blende refers (among other meanings) to a blind niche in a wall; thus the Freiberger Blende is like a wall niche that you can carry with you. Of course the Freiberg miners themselves referred to it simply as a Blende.

The Freiberger Blende, first described in a 1743 glossary of min- ing terms (Johann Caspar Zeisig's Mineral und Bergwerks Lexicon), had other advantages as well: If the working face in the mine was relatively wind and water-free, the small, spherical oil lamp, called a cuckoo (Kuckuck) lamp, could be removed from the Blende and set up on a rock, secured with a piece of clay, thereby providing all-around lighting like the frog lamp. The Freiberger Blende was provided with a fixed, well-made wrought-iron (or rarely copper) hook on the back, so it could be hooked into the miner's vest or collar strap and worn on the chest, on his belt, or hooked onto the front of an ore car like a headlight. Such practices would be dan- gerous with an open frog lamp swinging around on its hook chain.

Figure 14. Freiberger Blende, late 19th- century, with spherical "coo-coo lamp" and separate socket for a candle. Staatliche Kunstsammlungen Dresden, Grünes Gewölbe collection; Jürgen Karpinski photo.

Freiberger Blenden existed in a number of different variations. Some had no sliding front window and thus no need for ventilation holes; these were the earlier models and sometimes fetch a premium on the collector market. In practice, the front window was rarely used anyway. Some were lined with sheet tin instead of brass; originally only mine supervisory personnel were allowed to use brass-lined lamps as a sign of high rank, while the lamps of the common miner were lined with tin-plated steel. Eventually, though, brass lining became standard for all Blenden. Some lamps (probably the most recent) were constructed entirely of sheet metal. Sizes ranged from around 15 cm (children's and visitors' models) to around 27 cm in height. Ordinary miners generally used the cuckoo oil lamp in their Blende, whereas the mine surveyors (Markscheider) usually used a candle; consequently some Blenden have both a socket for a candle and a stub for mounting a cuckoo lamp.

Some examples have been referred to specifically as Annaberger Blenden and Schneeberger Blenden, as well as Freiberg Blenden. Slight differences in construction—particularly regarding the design of the upper part of the sliding window—for each Saxon mining town may have been typical. However, it is still unclear whether Blenden from all nine early Saxon mining districts (Altenberg, Annaberg, Scheibenberg, Freiberg, Johanngeorgenstadt, Marienberg, Geyer, Ehrenfriedersdorf and Schneeberg) had any consistent and identifiable differences in design. Freitaler Blenden, however, were characterized by a hinged front window. The practical virtues

of the Freiberger Blende eventually became widely recognized, and its use spread beyond the Freiberg region to other mining regions in Germany and Central Europe.

Freiberger Blenden are eagerly sought after today by collectors of mining lamps and artifacts. Modern replicas of the Freiberger Blende are still made in the Erzgebirge for use in miners' parades, but they have little collector value and bear little resemblance to originals in their construction techniques and materials. Outright fakes are also known, and should be rejected. Every little wormhole and nick indicative of actual use is valuable testimony to authenticity. Old brass sheet metal commonly develops cracks with age which, if present, are a good indicator of authenticity. An accumulation of dust and dirt in the vertical slots for the sliding window is also a good sign. And the hook on the back should be affixed with rivets rather than screws. Miners carefully cleaned the brass lining each day, lest the reflectivity be diminished, but black tarnish in the cracks and around nail heads shows age.

OTHER SAXON MINING COLLECTIBLES

Virtually everything that the early Saxon miners used, wore or made had significance and is therefore collectible. Following is a partial list of some of the other types of collectible Saxon mining memorabilia, antiques, artifacts and folk art.

Ore cars
Miners' paintings
Saint Barbara cult items
Photographs, engravings and prints of mining scenes
Mining scene postcards
Mining scene stereo-cards
Miners' sculptures, carvings and statuettes
Miners' dioramas (Handstein, Guckkästen, Buckelbergwerke, Geduldsflaschen, etc.)
Miners' machinery models
Miners' surveying instruments
Mine scales and assaying equipment
Miners' uniforms
    Working uniform (Bergarbeiterjacke, Bergkittel, etc.)
    Parade uniform (Paradejacke, etc.) Miners' pins, badges, insignia and medals
Miners' beer steins (Bierkrüge) Mining-theme glass and porcelain items
Miners' swords (Bergbausäbel, Bergschwert)
Miners' hats
    Working hats (Berghut or Schachthütte)
    Parade hats with plume (Schachthut mit Federbusch)
Miners' lamps
    Carbide lamps
    Safety lamps
    Candle holders
    Oil torches (Rüböllampen)
Miners' fanny-packs/knife-holders (Tscherpertasche) Miners' utility knives (Tscherper)
Miners' seat-protector (Bergleder, Arschleder) Miners' walking stick (Steigerhäckel)

SOURCES

ABACKER, H. (1960) Von Beilen, Barten und Häckchen. Freiberger Forschungshefte, 31.

BANZHAF, D. W. (1979) Berghäckel. Der Stocksammler, n. 2, 17–31.

BORCHERS, G. W. A. (1911) Ein Beitrag zur Volks- und Heimat- skunde des Erzgebirges. Mitteilungen des Freiberger Altertums- vereins, Heft 47, 20–36.

BORCHERS, G. W. A. (1912) Fälschungen erzgebirgischer Altertü- mer. Mitteilungen des Freiberger Altertumsvereins, Heft 48, 96–98.

BORCHERS, G. W. A. (1916) Vor 150 Jahren: Bergbau- und kul- turgeschichtliche Bilder auf der Vergangenheit des Erzgebirges'. Jahrbuch für das Berg- und Hüttenwesen im Königreich Sachsen, A 181–197: 188.

BORCHERS, G. W. A. (1917) Ursprung und Zweck der Bergbarte. Mitteilungen des Freiberger Altertumsvereins, 51, 62–64.

BORCHERS, G. W. A. (1923) Bergbarten. Mitteilungen des Freiberger Altertumsvereins, 54.

FIEGE, H. (2006) Zur Entwicklung der sächsischen Unschlitt Grubenlampe. Der Anschnitt, Beiheft 20, 87 p.

HOFFMANN, C. R. (1830) Der belehrende Bergmann: Ein fassliches Lese- und Bildungsbuch für Kinder und Erwachsene ... mit einen kurzen Geschichte des Bergbaues und e. erklärenden Wörterbuche der gewöhnlichsten bergmännischen Ausdrücke. Pirna August Robert Friese, 232 p.

POHS, H. (1995) The Miner's Flame Light Book. Flame Publishing Company, Denver, p. 104–110.

POREZAG, K. (1982) Des Bergmanns offense Geleucht. 2nd edition, 4 vols. Verlag Gluckauf Gmbn, Essen.

RIESS (1916) Über den Ursprung der Bergbarte. Mitteilungen des Freiberger Altertumsvereins, 51.

RIESS (1917) Über den Ursprung der Bergbarte. Nachträge zu Heft 51. In: Mitteilungen des Freiberger Altertumsvereins, 52.

WILSON, W. E. (1981) Frog Lamps: A Survey of Examples from 1529 to 1979. The Rushlight Club, 110 p.

ZECHA, S. (1992) The Blende lamp. Mining Artifact Collector, no. 15, p. 34–36.

The Kerckhoff Patent Candlestick

A Newly Discovered Patented Miner's Candlestick

Wendell Wilson

It is amazing to me that hitherto unknown kinds of mining artifacts continue to turn up after all this time. In fact, in the weeks right after my recent book on miners' candlesticks came off the press, I acquired not one but two candlesticks I had never seen before and had not illustrated in the book. One is the example pictured here. A candlestick that is free of any markings can be difficult to trace; however, this one has an abundance of markings which *should* make historical research easier.

Kerckhoff patent candlestick with the removable hook in the vertical position

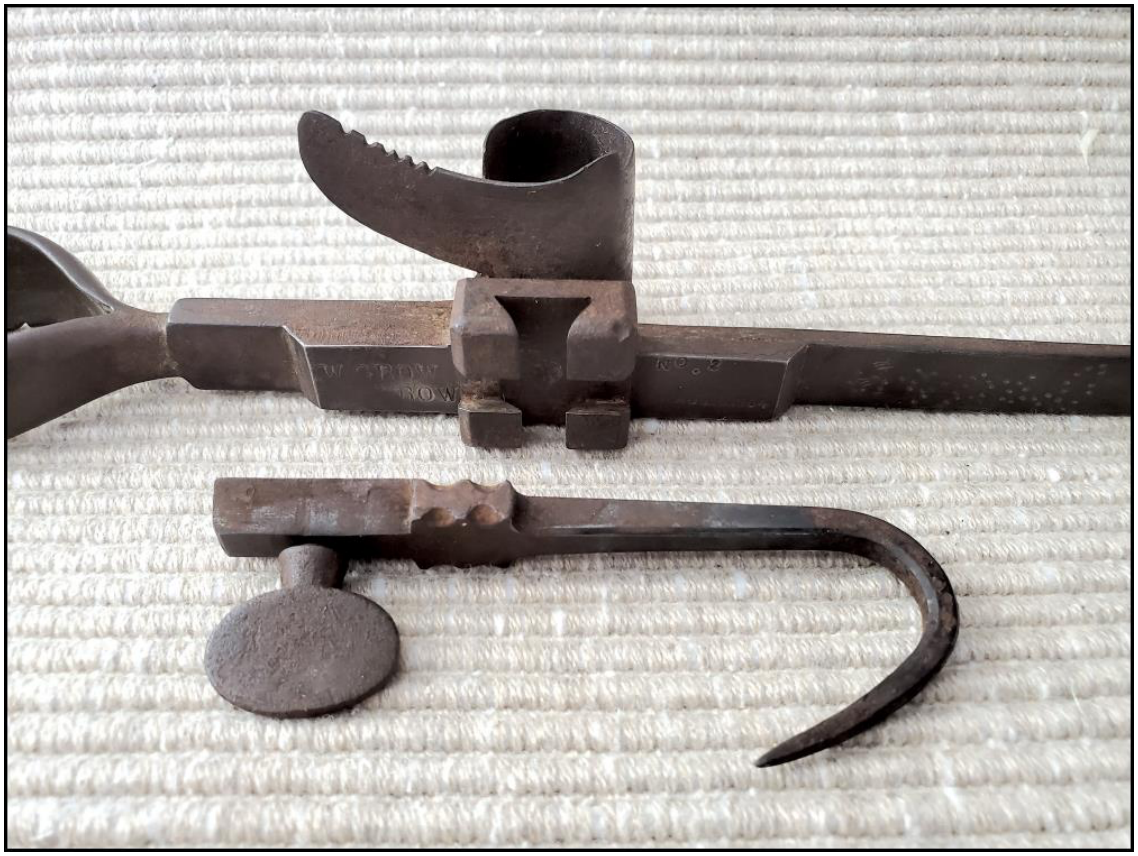
Provenance

This candlestick (purchased recently on eBay) turned up in a box of junk in an abandoned storage unit in San Diego, suggesting that it may have a California origin. The highgrader's handle, typical of candlesticks from the California gold country, makes that origin even more likely.

Construction

The body of the candlestick is made from one piece of steel, folded around and brazed together at the handle neck in the usual manner of countless other blacksmith sticks. However, it is

mechanically unique in having a brazed-on two-way steel mounting block for attaching the hook. The hook can be removed and repositioned horizontally or vertically, secured in place by a thumb screw. And, as mentioned, it has a wide, scooped-out handle referred to by collectors as a "highgrader's handle" wherein small bits of gold could be surreptitiously stuck with a dab of candle wax. The thimble lever has a flared design and the shaft of the hook has some minor ornamentation. There are six small notches on the underside of the handle, three on each side. The seller said the thumb screw is a replacement; if so, it is a very good one because it fits perfectly and has an identical patina of black oxide compared to the rest of the stick.

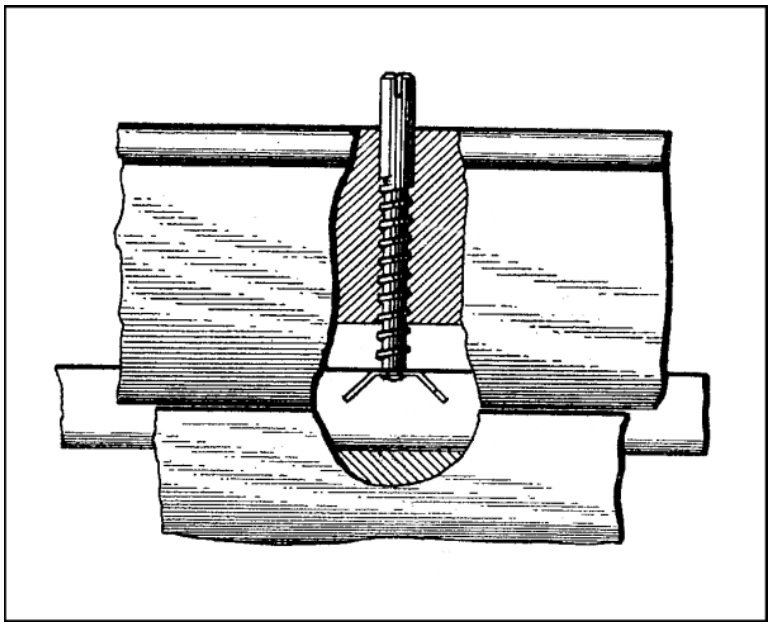


The Patent

The candlestick is clearly stamped with a complete patent date, "PAT. AUG. 16, 1904." The gang stamp is small, apparently sized to exactly fit the available space on that part of the stick. It is a previously unknown patent for a miner's candlestick, probably because that application is not mentioned in the patent papers and consequently does not turn up in a search.

U.S. Patents in those days were granted once a week, and August 16 was one of those days. All patents granted on that date are listed in the *Official Gazette of the United States Patent Office*, Volume 111, number 7; there are 768 of them. Unfortunately *none* of them are identified as having a mining application, nor do any bear an obvious resemblance to a repositionable hook. Simple searches on the words "miner," "mine," "mining," "candlestick," "candleholder," or even "candle" turn up no candidates among the 768 patents. Therefore the patented feature must be part of some other application.

Restricting the search to patents granted on that date in California reduces the number of candidates to 21 – from potato slicers to windmill regulators, hose-couplings, briquet-machines, gas valves and cuspidor lifters (!). After studying them all, I realized that the patented feature on the candlestick was not the repositionable aspect of the hook but just the simple locking mechanism for a sliding, beveled track with a set screw: Patent number 767,896, “Adjustable Screen and Sash for Windows” by Herman Henry Kerckhoff of Los Angeles. The mechanism is described in the patent as follows:



Patent drawing showing the sliding track stabilized by a set screw

“The combination of a groove member [the two-way candlestick block] having a hole therethrough, an adjusting screw member extending through the hole [the thumb-screw], a tongue [the hook] fitting movably in the groove, and having a cut-away portion extending inwardly and longitudinally from a side edge [i.e. beveled]...such cut-away portion being open side-wise of the tongue...so as adapted to be slid into said cut-away portion, and said attaching means engaging with the groove to retain said means from sidewise displacement [to secure it from sliding in the groove].

Note the indentation in the center for seating the point of the thumb screw.

In the case of this candlestick the screw hole is not through the candlestick block (the thimble would be in the way) but through the base of the hook; the principle is the same. In the patent drawing the head of the locking screw is shown with a slot for a screwdriver, but changing it to a flange to make a thumb screw head would be a natural adaptation for use in the candlestick, so that a screwdriver would not be unnecessary when a miner is repositioning the hook.

Patentee Henry Herman Kerckhoff (1867-1953)

Herman Henry Kerckhoff

Herman Henry (Heinrich) Kerckhoff was born in Lingen in the Province of Hanover, Germany on January 20, 1867, and came to the U.S. as an infant in 1868 with his parents, Georg and Philippine (Neuhart) Kerckhoff. They arrived in the port of New York aboard the *S.S. Hansa* on August 31, and initially settled in Indiana. The family moved to Los Angeles while Herman was still a boy; there he graduated from high school in 1884 and attended the University of California, majoring in Chemistry (his "class yell" was "Ha! Ha! Ha! Eureka!"—he served as class treasurer). After three years there he left without graduating (in 1888) to take a tour of Europe, and after his return he went to work as a clerk in his elder brother's business, the Kerckhoff-Cuzner Lumber and Mill Company. In October 1899 he married Anne May Wethern; they appear on the 1900 census for Los Angeles, Herman listing his occupation as a "lumber merchant." Herman and Annie had two sons, Herman Henry Kerckhoff Jr. (1905-1992) and Stephen Kerckhoff (1901-1967).

In 1900 he established the Hipolito Screen and Sash Company, serving as president—which explains the initial development and use of his patented invention. Herman applied for his patent on July 18, 1902 and received it over two years later. The 1910 and 1920 censuses list him as a "manufacturer" with a "sash and door company." But he also had an interest in mining; in 1912 he established the Avawatz Salt & Gypsum Company, with the intention of erecting a modern salt refinery and building a 16-mile railroad to Death Valley. The company's holdings there

included 2,450-acres of high-grade halite, gypsum and celestine deposits in the Avawatz Mountains, located in the Mojave Desert of San Bernardino County. Railroad construction and mining ceased permanently with the outbreak of World War I, but the 1930 census still lists Kerckhoff as a "developer, mineral deposits"—a long-term involvement that no doubt inspired his adaptation of his window sash patent to the design of a miner's candlestick. By 1940, at age 73, he had retired from his activities in the wholesale lumber business. Herman Kerckhoff died in Los Angeles on April 1, 1953.

Rarity

Apparently this is only the second example made, as it is stamped "No. 2" above the patent date. I have never seen another example, and have no evidence to suggest that more than two were made. The location of No. 1 remains unknown.

The Maker

Another name is also stamped on the mounting block, on the other side of the hook from the patent date. This one is also applied with a gang stamp—like the patent date, but sized in larger letters to fit the available space, suggesting that it might be the name of the seller or the maker (miners rarely had their own gang stamp). It says "W. GROW" and below that a partial impression of the same stamp showing only the last three letters, "ROW". Apparently this lower impression was the first strike, which didn't take well, so it was struck a second time to show the full name.

"Grow" is a fairly rare surname. The fact that the candlestick was found in California, that it has a California-style highgrader's handle, and was patented by a California resident all suggest that the search for "W. Grow" should center on California.

There is William B. Grow, listed in the 1900 census (born Dec. 1861) for Ventura, California, and employed there as a machinist. In the 1901 Philadelphia City Directory he is listed living at the same address (perhaps just visiting family) with two blacksmiths, John William Grow and Cyrus Franklin Grow. All of them ultimately moved to California. By 1922, William B. Grow was listed in the City Directory for Yuba, California, as a machinist working for (or perhaps owning) the Yuba Construction Company (called the Yuba Manufacturing Company after 1917)—they had a "big iron works out on twelfth street" employing over 100 men. By the 1930 census he was aged 69, living in Marysville, Yuba County, and identified as a machinist working in his "own shop." He was an inventive sort, and had been granted at least two patents—in 1901 for a well-driving device, and in 1926 for a hand truck. He was an early automobile enthusiast,

and his manufacturing company also eventually made tractors. He died in 1934 and is buried in Sutter, California. There is no evidence that he was connected with mining in any way; but he or an employee could have been the maker of the candlestick, providing ironware to the local gold miners.

Or, if the gang stamp does indeed refer to a miner who owned it, the 1900 California Census shows a gold miner by the name of William S. Grow, born in Germany in 1865 and living in Downieville, Sierra County. He had immigrated to the U.S. in 1882. There are only three other men named William Grow on that census, none of them working as miners or blacksmiths. But in rare cases miners have had enough blacksmithing skill to fashion a candlestick, so who knows?

At this point we can offer only speculation, as there is no hard evidence regarding who crafted this candlestick. All we can say for certain is that the maker was an experienced and skilled blacksmith who had made candlesticks before. After all, the highgrader's handle is not a part of the patent; only someone with previous experience making miners' candlesticks would include it. It is quite possible that "W. Grow," whoever he was, made the candlestick, probably through a connection with the patentee Herman Kerckhoff. In any case, the maker was probably a blacksmith or a machinist and not a miner. As mentioned, miners rarely had gang stamps made of their own name, but a blacksmith would.

The Owner

The initials of a presumed owner, "PMD," stamped one letter at a time, appear in two places. In one case the letters are stamped (clearly but rather poorly) using individual letter stamps that jittered around under several blows, leaving multiple impressions. In the other case they are spelled out using a die punch, one dot at a time.

The punched name on the spike. Can you read it?

More frustrating is the die-punched lettering on the side of the spike, which is so crudely and poorly done that, even though each dot is clear enough, it is virtually impossible to recognize what all the letters are supposed to be, or even which way is up. My best guess is that it says “Pedro” (up-side-down) which would fit with the PMD initials also applied with a punch, but I could be wrong.

It is highly unlikely that “PMD” was the maker of the stick, as his signature initials are much too crude for such a skilled blacksmith.

Hook stowed in the horizontal position

Sources

U.S. Federal Census Records
Western Edition *Notables of the West*, Vol. I, page 94.
International News Service, New York, Chicago, San Francisco, Los Angeles, Boston, Atlanta (1913).

Official Gazette of the United States Patent Office, Volume 111, number 7:
https://www.google.com/books/edition/Official_Gazette_of_the_United_States_Pa/1W4bAQAAMAA

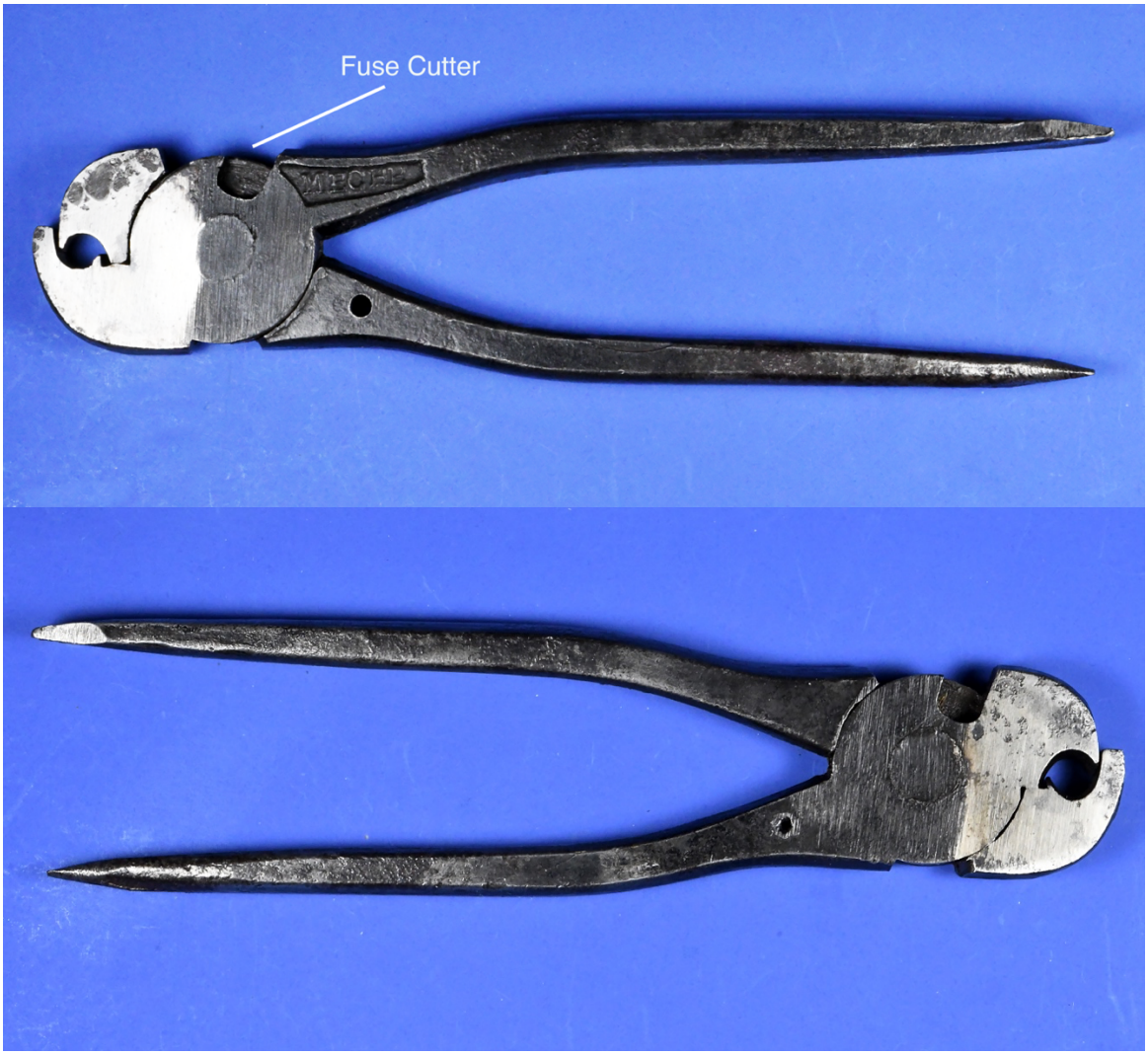
Online Archive of California
Men of the Pacific Coast, *containing Portraits and Biographies of the Professional, Financial and Business Men of California, Oregon and Washington, 1902-1903.* (1903) Pacific Art Company, page 382.

Two Pairs of French Blasting Cap Crimpers

Douglas K. Miller

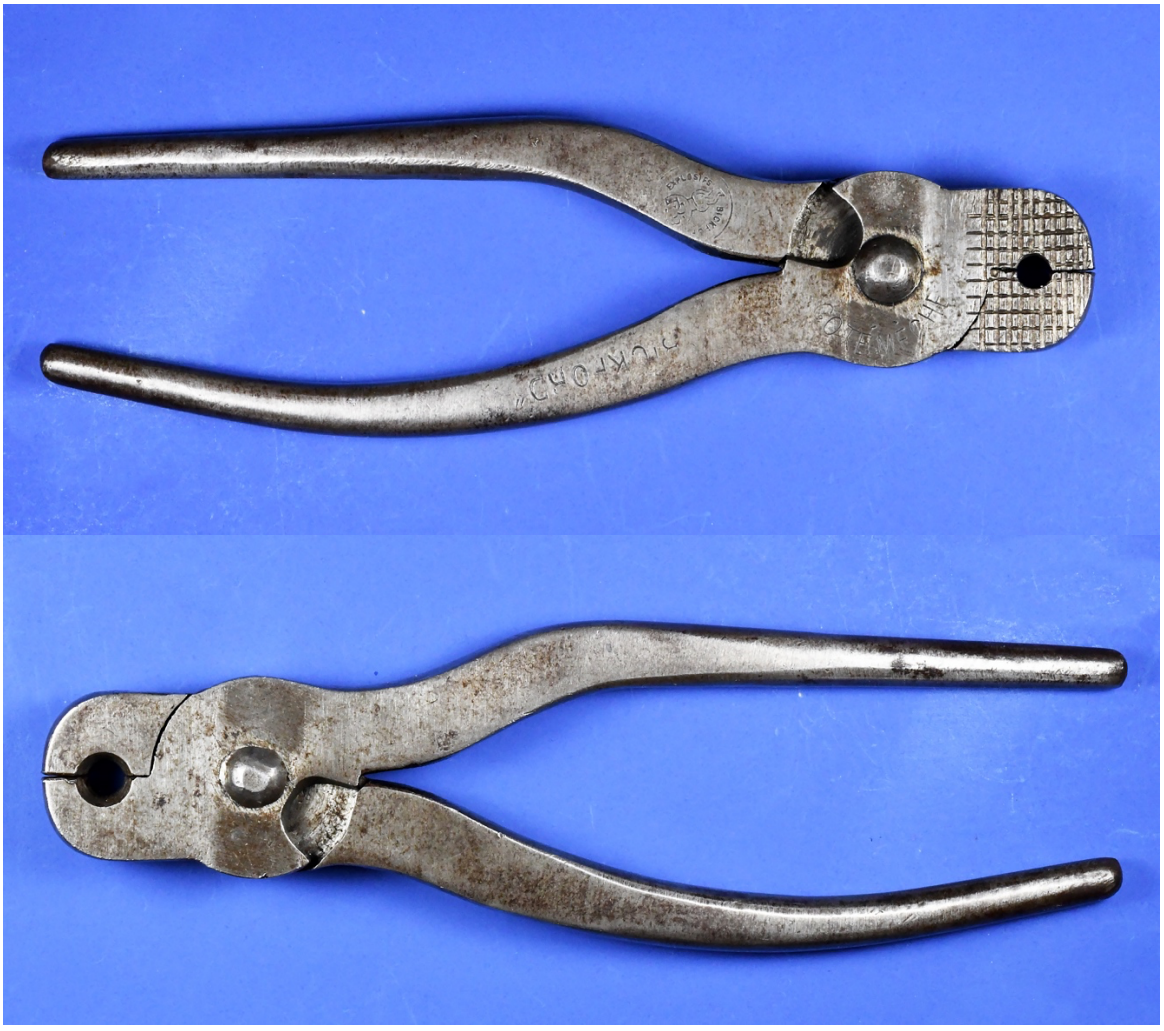
Here are two more sets of blasting cap crimpers from Reg Pattee's collection. They are both French. Each is quite hefty, and each probably produced a very different crimp.

The first set is plain and has a blackened finish. It is 6.25 inches long and weighs 5.8 ounces. Compare this with a pair of Atlas No. 2 crimpers, which are 7.25 inches long and weigh 5.0 ounces. The French crimpers incorporate a fuse cutter on one side of the jaws, a dynamite punch on one handle, and a screwdriver on the other handle. A wire stripper can also be seen on the lower handle near the jaws. The word "MECHE" is stamped into the upper handle near the fuse cutter and seems to point to the cutter. I believe this is intentional, as the word MECHE means "FUSE." Otherwise, these crimpers are unmarked.



This is a closeup of the jaws showing the word MECHE pointing to the fuse cutter. If you look closely at the jaws of this crimper as shown here and in the first photo, it looks like this crimper would produce a somewhat oval crimp, perhaps with a vent hole, that was almost certainly not water proof. However, it may have been used to crimp a cap repeatedly as described below.

The second set of crimpers is much more interesting because of its design and its markings.

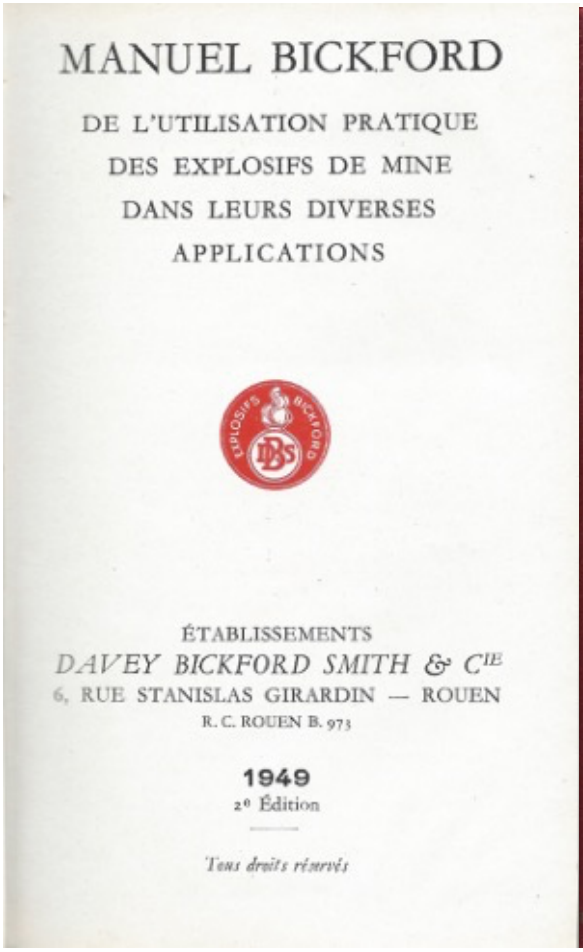


These crimpers are 6.12 inches long and weigh 5.3 ounces. They incorporate a fuse cutter (marked by the arrow) below the crimping jaws. Stamped into the crimpers below the pivot pin are the words "COTE MECHE," which mean "FUSE SIDE." Note that the sides of the jaws on this side of the crimper are heavily knurled, while the sides of the jaws on the opposite side of the crimper are smooth. On the upper handle is a trademark that looks like a "flaming bomb" with the initials "DBS" inside, surrounded by the words "EXPLOSIFS BICKFORD," all enclosed within a circle. The opposite handle is also stamped with the name BICKFORD.

Another unique feature of these crimpers is the crimp they would produce. The crimping jaws are tapered and would seemingly produce a "conical crimp," wider on one side, narrower on the opposite side. You can see this by comparing the diameter of the crimping opening on one side of these crimpers with the diameter of the opening on the opposite side. The opening on the heavily knurled side, the side marked "Fuse Side" (COTE MECHE), is smaller in diameter. What that tells you is that, after the fuse was inserted into the blasting cap (détonateur), the cap was inserted into the crimpers with the fuse protruding from the fuse side. But how would the powderman read the lightly stamped words "Fuse Side" in the dark or in reduced light? He wouldn't, but he could *still tell* which side was the fuse side by *feeling* for the knurled surface on the fuse side of the jaws. It's a clever design.

The trademark and name on these crimpers stand for Davey Bickford Smith and Co. ("et Cie"). The name "Bickford" refers originally to William Bickford who, in 1831 invented safety fuse, and in conjunction with his son John, his son-in-law George Smith, and practical miner Thomas Davey, manufactured and marketed it. William Bickford died in 1834. After Thomas Davey also died, his son, Thomas Davey, Jr., continued the work of his father until he too died in 1863. Thomas Davey, Jr.'s brother, Simon, expanded the business in France as Davey Bickford Smith. This became the international company Davey Bickford, which still survives today.

I recently purchased a Bickford Manual from 1949. It is similar to DuPont's "Blasters Handbook." Here are photos of the cover and title page.

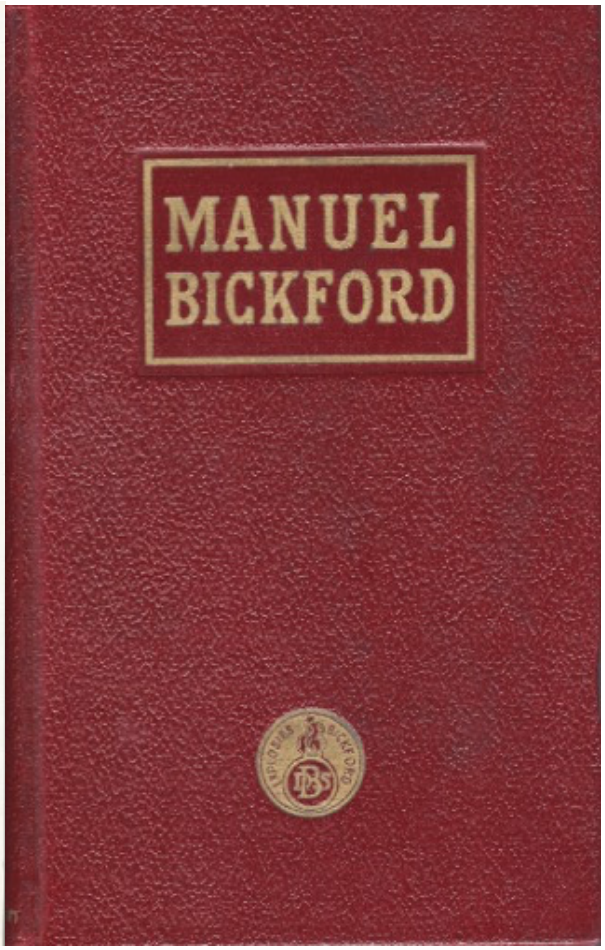

MANUEL BICKFORD

DE L'UTILISATION PRATIQUE
DES EXPLOSIFS DE MINE
DANS LEURS DIVERSES
APPLICATIONS

ÉTABLISSEMENTS
DAVEY BICKFORD SMITH & CIE
6, RUE STANISLAS GIRARDIN — ROUEN
R. C. ROUEN B. 973

1949
2e Édition

Tous droits réservés



The Manual contains a drawing of the DBS blasting cap crimpers pictured above and an illustration of how they were used and of the crimp they produced. Here's a translation of the relevant portions of the Manual.

Cover page:

MANUAL BICKFORD

OF THE PRACTICAL USE OF MINE EXPLOSIVES IN THEIR VARIOUS APPLICATIONS

4

Pages 50-51

Attaching a safety fuse to a detonator using crimping pliers.

The ignition of a detonator should be caused only by the flame given off by a safety fuse. We will see all the precautions that are necessary to fix a detonator on a safety fuse. This last operation is called crimping, it must be executed with the greatest care and cannot be corrected.

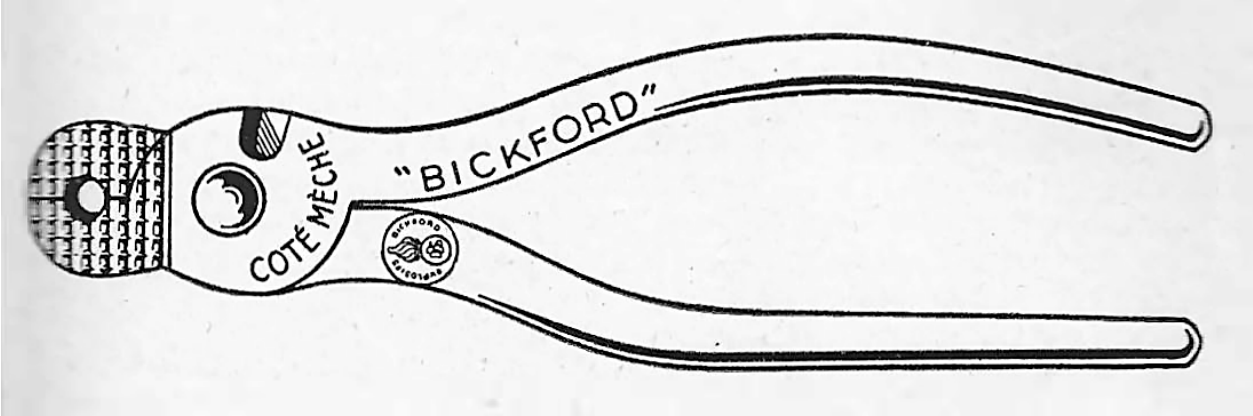


Figure 22. Crimping Pliers

Proper crimping can be assured only by means of a set of good crimping pliers, an excellent model of which is shown above.

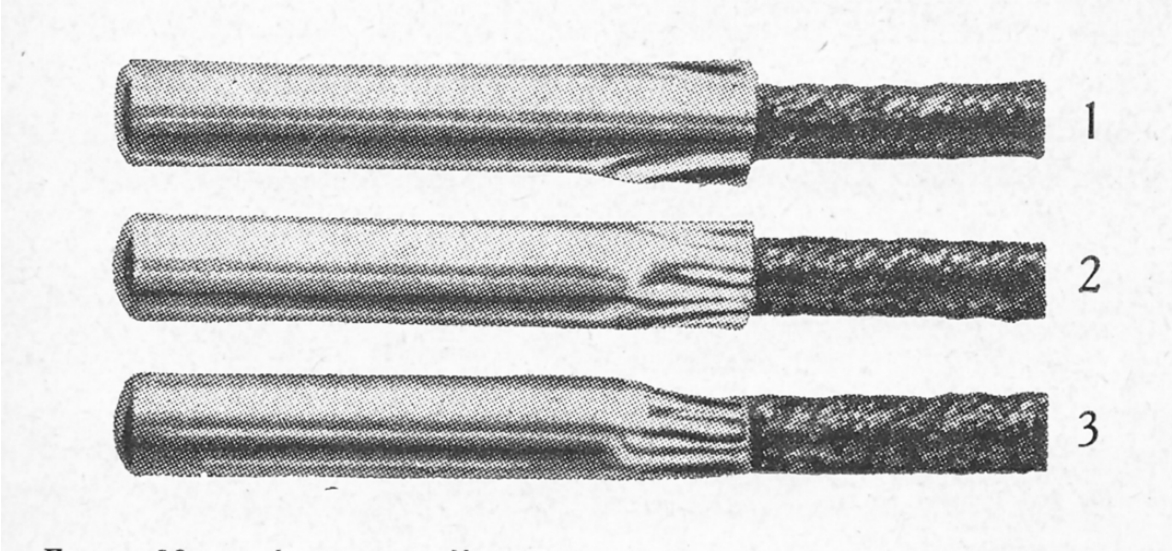


Figure 23. - Crimping of a detonator on a safety fuse by 3 successive maneuvers of the crimping pliers.

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It appears from this illustration that the blasting cap was supposed to be rotated slightly each time the crimping jaws of this crimper were closed until a tight crimp was achieved. This is a wonderful set of crimpers from a company whose name is synonymous with blasting. If you can find a pair, grab them.

Justrite Parts-bin Lamps of the 1920s

Dave Thorpe

From 1911 to 1920 Augie Hansen, a Danish immigrant living in Chicago was chief lamp designer at Justrite Mfg. Co. His designs began with the horizontal tank lamp and later the elegant X-ray lamp. He created several modifications for the horizontal lamp that included the ribbed base with bottom-seam, the Jiffy container, the Spiral feed, the Duplex Feed, the Liberty Feed, and the gasketed water door. The Jiffy container, perhaps the most radical innovation, eliminated the screw-threads that join the water tank to the carbide chamber, and instead used a "helix locking device" requiring only a half-turn.

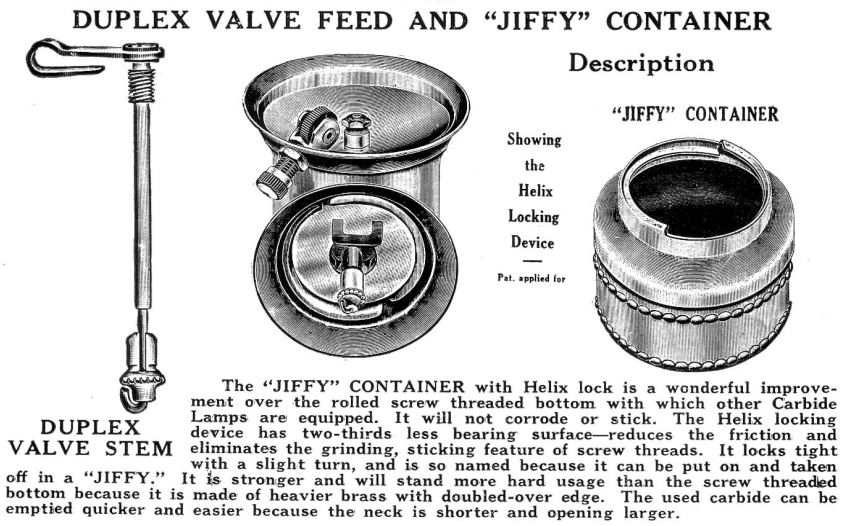
The evolution of Hansen's designs. Left: Hansen's 1912 patent for the "horizontal" cap lamp that remained in Justrite's lineup for three decades. Center: Hansen's X-ray lamp (ca. 1918), designed near the end of his tenure with Justrite Mfg. Co. Right: The Hansen lamp (ca. 1925) manufactured from his own company, post-Justrite.

Hansen left Justrite in 1920 to form his own company. His assistant William Frisbie filled the vacancy and immediately discontinued many of Hansen's inventions. As a consequence, a quantity of stamped parts from the Hansen era lay in inventory. A number of these were assembled into unadvertised piecemeal lamps. These non-standard lamps are uncommon and fascinating.

The reused parts were:

1. Jiffy Container "helix locking device"
2. Jiffy Container water tank shells
3. X-ray reflectors
4. X-ray bases

The Jiffy Container



All Jiffy lamps with the "helix locking device" during the pre-1920 Hansen era contained the Duplex Valve Feed.

The use of Jiffy Containers required a wider lamp neck to accommodate the "helix locking device." This can be recognized externally by the height at which the neck of the lamp joins the horizontally oriented tank cylinder. On standard (non-Jiffy) Justrite lamps the parabolic crease at this transition point does not encroach into the stamp mark. However, lamps with the Jiffy Container, which require a larger diameter neck, have a higher crease that touches the lower letters of the stamp mark. This observation allows one to recognize a Jiffy Container by simply viewing it from the side. Another feature associated with the Jiffy water tank shell is a raised surface on top of the tank with very fine water lever notches – distinctly different from other Justrites.[1] In summary, the water tank shells for Jiffy lamps have two specific features: a high parabolic crease and fine water lever notches on a raised surface.

Left: Justrite Jiffy tank showing parabolic crease encroaching onto "OTHERS PENDING." Also note high shoulder beneath water lever. Right: Standard horizontal lamp with crease below stamp mark.

Examples of Parts-bin Lamps

Three horizontal Justrites that did not appear in catalogs or advertisements have been identified that combine parts from the pre-1920 Hansen era with Frisbie's post-1920 water feed. All of them include:

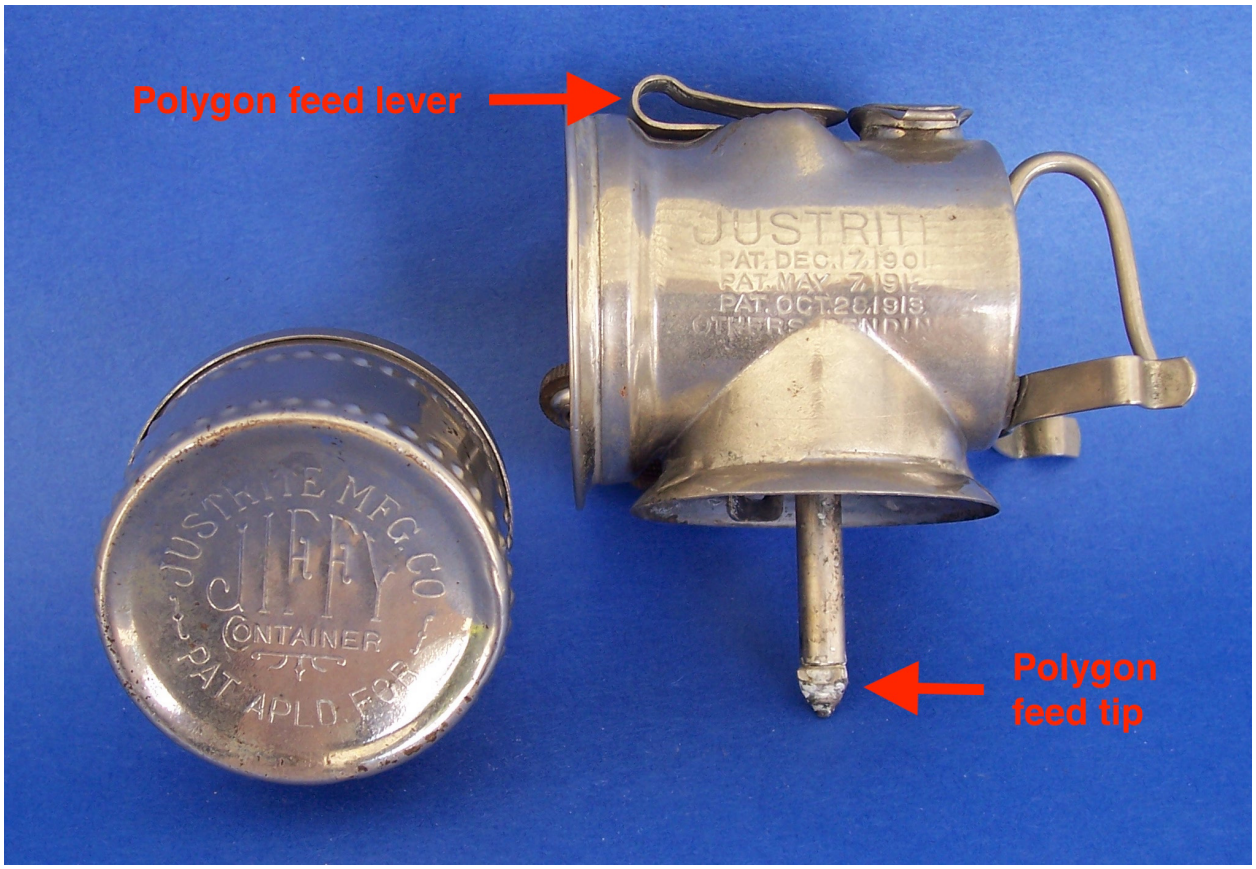
1. Jiffy tank shell
2. X-ray reflector

The lamp below uses the X-ray reflector and the Jiffy tank shell, but has a screw-threaded non-Jiffy base.

The next lamp shown has additional pre-1920 parts: the Jiffy “helix locking device,” and the X-ray style base (identified by ribs and the absence of a bottom seam). The bottom of the base does not have the “X-ray” stamp mark.

The final lamp uses a more standard Jiffy base (two rows of raised beads for gripping). It does not have the usual Jiffy stamp mark on the bottom.

Another lamp should be mentioned that is not technically a parts-bin piece: the post-1920 Justrite Jiffy. The lamp appears in almost every way to be a standard Jiffy lamp, with the simple exception of being outfitted with Frisbie's patented Polygon Feed in place of Hansen's Duplex Feed. The new feed dates the lamp's manufacture post-1920, yet the rest of the lamp's features (tank and base stampings) are classic pre-1920 Jiffy. Most if not all examples of this particular lamp are nickel-plated. It is entirely possible that existing complete Jiffy lamps had their Duplex Feeds removed and replaced with Frisbie's Polygon. A nickel-plated finish may have been applied to dress up the resoldering of the new feed or perhaps just to increase its sales appeal on a lamp thought to be dated.



Why were only some of Hansen's pre-1920 parts used? An overstock of parts is surely a factor, but many of his inventions never appeared on parts-bin lamps, including Spiral Feed, Duplex Feeds, and gasketed water doors.

End Notes

1. Late Spiral Feed lamps also have the raised shoulder with fine notches.