THE MINERS' FUSE-LOCK: A PERCUSSION-CAP REMOTE FUSE LIGHTER

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In 1805, many years before the idea of a cartridge bullet was conceived, the "percussion lock" (successor to the venerable flintlock) was invented by the Reverend Alexander John Forsyth in Aberdeen, Scotland. Basically it consisted of a small amount of fulminate of mercury which was placed in a pivoting magazine and struck with a hammer. The fulminate would ignite and send a hot jet of flame through a hole to set off a charge of black powder and thus discharge the gun. This was a tremendous improvement in speed and reliability over the flintlock.

With the financial backing of none other than James Watt, Forsyth patented his system in 1807. Napoleon is said to have offered him £20,000 for his secret, but he refused. It went through many stages of evolution by other inventors (the "patch lock," "pill lock," "tube lock," etc.), culminating in the "cap lock," invented by the English artist Joshua Shaw in the early 1820's. This innovation had the fulminate in a cap over the end of a tubular steel nipple. When struck by the hammer, the flame would shoot through the nipple and into the chamber. Within twenty years the cap lock had proven to be the most popular and practical form of firearm ignition.

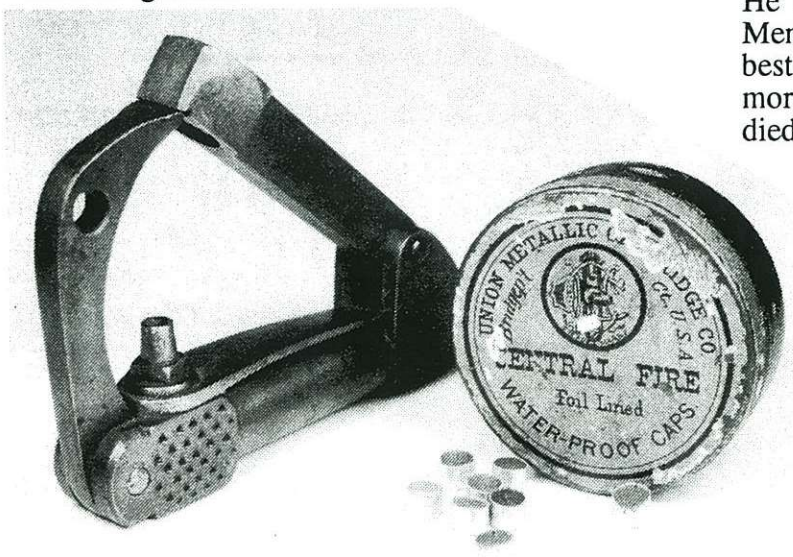


Figure 1. The original patent model of the "miners' fuse-lock" percussion-cap remote fuse lighter. It is all steel and is shown actual size (2.75 inches); Ted Bobrink collection. The percussion cap tin is from the author's collection.

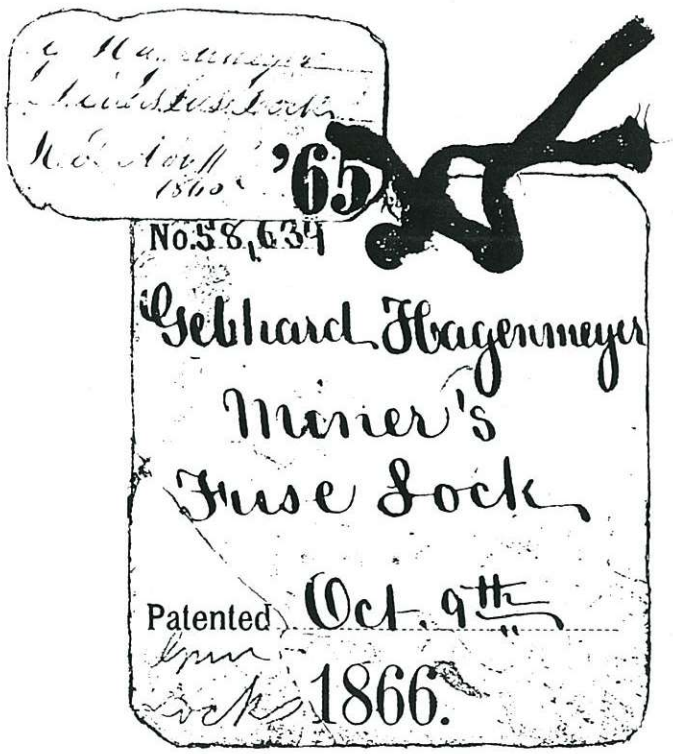
Prospectors and mining men from the 1830's to the 1870's carried percussion (cap lock) pistols, especially Samuel Colt's popular Paterson, Pocket, Dragoon, Navy and Army model revolvers. Consequently the percussion caps were universally available during those years, until the 1870's when metallic cartridges (modern bullets) finally took over the market.

It occurred to one resourceful inventor, Gebhard Hagenmeyer in Big River, California, that the percussion cap system could be used to ignite fuse as well as firearms. The ingenious device shown here (patented Oct. 9, 1866) was the result.

Gebhard Hagenmeyer was born December 1, 1831, in Wurtemburg, Germany. His farther was a mechanic, and taught him the trades of gunsmithing, blacksmithing and machining. Hagenmeyer emigrated to the United States around 1852, and settled with his brother Joseph in the Mendocino area north of San Francisco; they were the first white men to live there. Gebhard became a naturalized citizen in 1863, and worked with his brother at their water-powered saw mill, then later as a blacksmith on the Indian reservation near Fort Bragg, and after that as an engineer at the Mendocino saw mill. He also built at least two water towers in the Mendocino area. He was considered one of the best machinists on the coast. By 1880 he had more or less retired, and on May 13, 1901, he died in San Francisco. (Information compiled by Wilma Tucker from articles in the *Mendocino Beacon* 7/2/1879, 9/20/1884, 8/27/1887, 5/15/1901, from the 1880 census, and elsewhere.)

Hagenmeyer's fuse-lock operates as follows: A fuse was split at the end to better expose its powder core, and then was inserted into the hole at the back (right) end of the device. It was pushed in about 2 inches. Then the hammer or striker arm was raised and latched into position with the brace arm. When raised, the hammer (powered a heavy bar spring) depressed a small spike at the back end of the bar spring into the fuse, securing the fuse against slipping out. A percussion cap was then placed over the nipple, and a cord was tied through the hole in the brace arm. The miner retreated to a safe distance, then yanked on the cord. The brace arm was disengaged, allowing the hammer to strike the cap, which fired a jet of flame through the nipple to the fuse, igniting it. When the hammer fell, the securing spike was withdrawn from the fuse, releasing it. The miner then reeled in his fuse lighter before it could be buried or damaged by the ensuing blast. I tried it myself and it works (my ears are still ringing).

Figure 2. The original patent model tag.



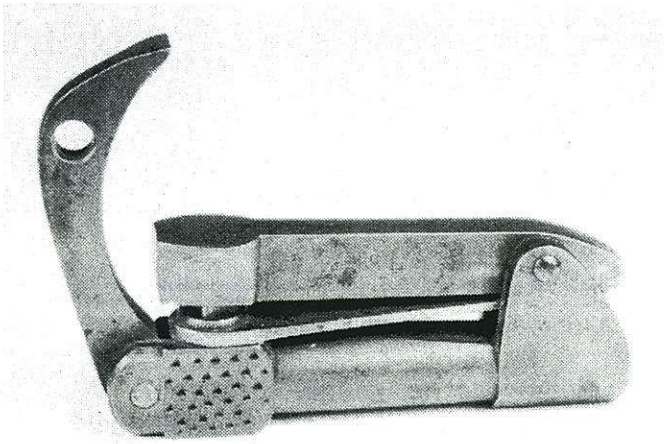


Figure 3. Side veiw of original patent model.

I am not aware of this device ever having achieved any popularity, probably because nervous miners simply allotted a longer length of fuse if they wanted more time. The patent model shown here is the only known example. But it was a clever idea for those circumstances when extracting one's self from the area set with charges might be awkward (and one didn't want to get hung up while the fuse was burning). Or for those miners who wished to economize on fuse.

Hagenmeyer's invention may actually have been inspired by an earlier device. His patent description clearly implies that percussion caps had previously been employed in some fashion for lighting fuse. He describes his own invention as "a new and useful *improvement* in miners' fuse-locks." However, I am unaware of any such earlier devices. Perhaps a reader can fill in the missing piece of the historical puzzle?

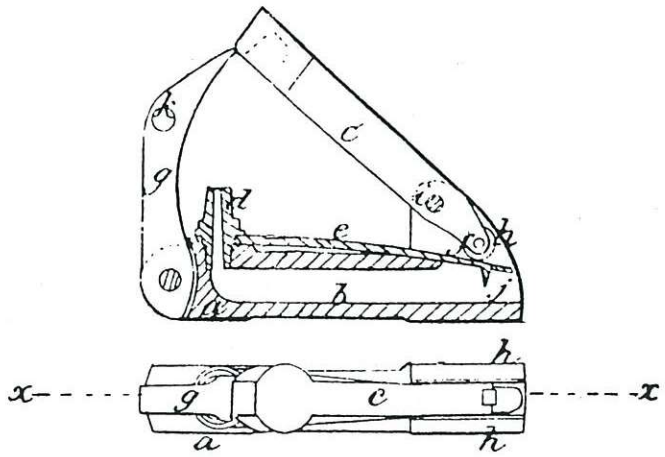


Figure 4. Original patent drawings.