THE ESSENTIAL PICK

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Boulder, Colorado

The pick is one of the few tools commonly recognized throughout North America as a fundamental symbol of mining. When considered as mining artifacts, picks have a surprisingly wide range of varieties, a fairly simple chronology, and many interesting and rare types.

Different types of mining; placer, hardrock, coal-stimulated the development of specialized picks to meet their specific requirements. Placer mining and prospecting, varieties of surface work, used the common railroad pick which featured one pointed tine and the other flat. For the most part, placer miners and prospectors used readily available common hardware store issues, but for deep clayey soil and thick gravel they modified railroad picks by lengthening and thinning the tines for better penetration and less resistance (Fig. 1). These became known as prospect picks and today are rare.

Figure 1. Top to bottom: Prospect pick, drift pick, poll pick. Two made by Collins & Co., poll pick made with Bealor process.

The drift pick, deriving its name from being used underground to drive drifts, was one of the few specialty tools developed for mining by miners (Fig. 1). Hardrock miners learned that long tines were a major encumbrance in tight tunnels and shafts and the wide blade of the prospect pick was fairly useless. They developed a two-pointed pick with short tines and a heavy swing weight. Hard rock dulled pick points quickly, so they were brought to a steep almost blunt point, not gradual and sharp as with coal picks.

While coal miners also found a double-pointed pick to their advantage, they did not like the drift pick used in hardrock– it was too heavy and blunt. Coal mining practices dictated production of lump coal (cobble-sized chunks) through undercutting and shearing. An undercut was a horizontal incision under a coal breast and a shear was vertical, and both were up to 6 feet deep requiring a miner to swing his pick with one arm in the narrow gap. The pick that best met these requirements had fine, tapering points, was light, and had a long handle (Fig. 2).

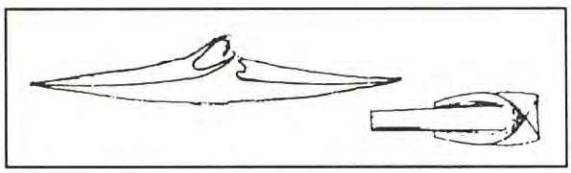

Figure 2. Martin Hardsocg's coal pick patent was a variation of the style known as the Pittsburgh Pattern. Although picks similar in shape date back to the 1870's, Hardsocg's design called for elongated handle shanks which were hammered against the handle to secure it (Pat 492,512). Martin Hardsocg established the Hardsocg Mfg. Co. in 1891 and worked on inventions in his company's shops at least into his 70's! The Hardsocg Mfg. Co. operated until 1969 (Johnson 1992). The Pittsburgh Pattern is the most common type of historic coal pick and is found from Pennsylvania to Colorado, although it is always nice to encounter one made by Hardsocg.

The "poll pick", also known as a "pawl pick" and "pick hammer", became established in mining by the 1870's (Fig.1). Timbermen and trackmen found it especially useful for trimming rock in tunnels and pounding on timbers, ties and rails. The poll pick was popular into the 1910's, after which it was mysteriously dropped by most tool companies from production.

All of the various types of pickheads were manufactured with similar methods which follow a chronology. Until the 1870's blacksmiths hand-

forged all pickheads. The process began when the blacksmith brought a length of square iron stock of his fire and either punched a hole in its center for the handle socket or slit the iron's center and spread it apart. He then hammered out the tines and finished their ends with either a "V" or a taper to one side, and to these ends he forge-welded hardened steel tips, which were longer-lasting than the soft iron comprising the rest of the pickhead. Telltale signs of a forge-made pick include a flat profile with no handle flange, evidence of slits at the apexes of the handle socket, and deformities midway on the tines where the hardened points were forge-welded (Fig. 3).

Figure 3. Two types of hand-forged poll picks. The top pick with its flat profile is most characteristic of hand-forged pickheads; the other pick features on odd profile uncharacteristic of machine manufacturing. In addition, it has slits at the apexes of the handle socket where it was spread. (Author).

These types of pickheads found in the field will exhibit differential weathering between the body and the points.

The first major change to manufacturing techniques began to take form in Newark, New Jersey on February 14, 1873, when Daniel Collins patented the first semi-automatic pickhead machine. Collins' device punched and spread the pickhead's handle socket and drew out the tines with sliding dies; the hardened points were forge-welded by hand in another step. John Klew was second to patent a semi-automatic machine in Pittsburgh on January 1, 1874, which was similar to Collins'. Both methods produced pickheads with crescent-shaped bulging handle shanks (Fig. 4).

Figure 4. Typical features of a pickhead made with the Collins Process. Note the crescent-shaped flange embracing the handle under which are slits at the apexes of the socket. On the left tine is the "Collins & Co./Hartford" gangstamp. (Author)

Collins moved to Hartford and established Collins & Co. which was one of the more prolific makers. Today it is possible to run across pickheads stamped with this name, albeit they are fairly rare. Although patent records reveal inventors including Collins and Klew patented only several other machine-based processes during the 1870's, it is likely that other manufacturers followed suit and became mechanized.

Another significant advance occurred when John Bealor patented a method in 1878 in Pittsburgh by which a semi-automatic pickhead machine, working with a block of hot iron, pushed open the handle socket with a mandrel, drew out the punched steel with rollers, and automatically forge welded the unconnected edges at the apexes of the socket to form a continuous handle flange ½"-1" high (Fig. 5).

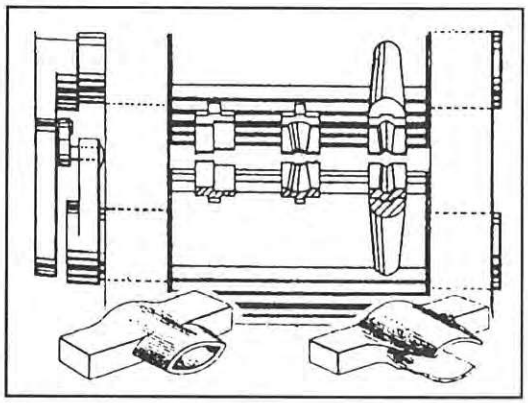

Figure 5. Patent illustrations of part of Bealor's pickhead machine and the stages that created the definitive handle flange. After the machine punched out the handle socket, the excess iron was drawn out in two halves, and the machine forge-welded them together. (Pat. 204,417)

Flanges of pickheads made with this process exhibit rough, uneven rims and crude, smeared seams at the apexes of the handle sockets (Fig. 6).

Figure 6. This drift pick was manufactured with the Bealor process. Note the ragged edge of the handle flange and crude forge-weld where its two halves were joined. The arrow points to the spot where the hardened steel tip was forge-welded onto the end of the tine. It is deformed due to blacksmith-welding and resharpening.(Author)

In addition, the process created seams inside the handles socket's apexes. This was the forerunner in shape of the modern pickhead. By the 1890's it is likely that machine-forged picks eclipsed those made by blacksmiths. By the 1900's many picks captured in historic photos exhibit features indicating Bealor's process was widely adopted, and today more picks made with Bealor's process exist than other forged types.

No matter the manufacturing method of picks, it was the blacksmith who kept them sharpened. Sharpening a pick involved pulling or burning off the handle for easy handling. For the both independent contract miners and large companies, hardrock or coal, this meant having to buy new handles, downtime for the precious tools, and having to furnish replacement picks to use in the interim. The solution to this problem was quite clever: a "mechanical pick" with detachable tines that could be replaced by sharp ones while the blacksmith worked over the dull set. It is unknown who invented the "mechanical pick", but the first patent was granted to Richard Walton at Clarington, Ohio on April 21, 1873(Pat. 144,803). Walton had a good idea but a poor design-the points of his pick had barbed pins held in a socket with small set screws (Fig. 7).

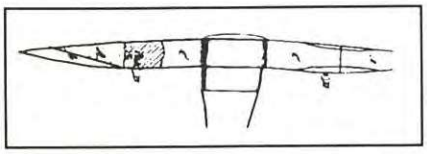

Figure 7. The first mechanical pick which was patented by Richard Walton in Clarington, Ohio in 1873. Pins on the butts of the detachable points fit into sockets in the ends of the tines, and they were clamped in place with set screws. This was a good idea but the design was too delicate and it was subject to dirt and corrosion. (Pat. 144,808)

After a little time in muck, water, and banging on rocks they could have either broken or seized. The second design, much more practical, was patented by Thomas Correll in Canton, Ohio on March 3, 1874 (Pat. 148,038) (Fig.8).

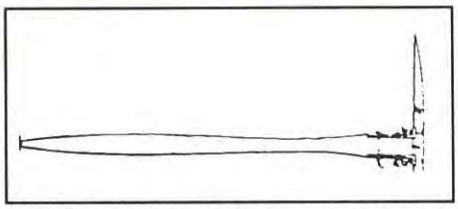

Figure 8. The second mechanical pick patented in 1874 by Thomas Correll in Canton, Ohio. The tines, which were a one-piece unit, bolted to L-brackets which, in turn, were screwed to the handle. This concept was much more practical than Walton's and formed the bulk of mechanical pick patents. Even if the bolts rusted shut, they could have easily been sheared off by a blacksmith. Note similarity of design to the Eyeless pick below; however, unlike the Eyeless model the thin tines suggest it was intended to a coal pick. (Pat. 148,038)

Correll's design called for a detachable tine which bolted to the pick handle. During the 1870's most patents were for replaceable points, while from the 1880's to the 1920's replaceable tine designs outnumbered replaceable point pickheads by 3:1. Joseph Fawkee patented the first mechanical coal pick on February 1, 1876 in Philadelphia (Pat 172,984). This design was similar to Walton's, but the set screw clamping the tines were better and the overall unit was lighter.

A significant advantage of removable tines was the possibility of interchangeable parts

allowing the tool to be converted, such as changing from prospect pick to drift pick to poll pick. This is exactly what some inventors had in mind, as suggested in patent titles or text (patents 522,966; 546,505;620,077;938,955; 1,148,633). The first patent for a multifunctional tool was granted to J.L. Woolley in Boulder, Colorado on Nov. 20, 1877. Woolley's tool allowed its removable tines, which had a slight angle, to be inverted for prying (Fig. 9).

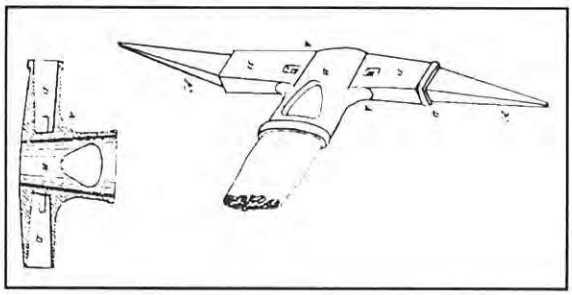

Figure 9. The first mechanical pick specified for multipurpose was patented in 1877 by J.L. Woolley in Boulder, Colorado. Both tines were pointed, indicating it was intended to be a drift or coal pick, and when reversed they could fulfill different functions. Boulder was situated between hardrock and coal mining districts, either of which may have been Woolley's target market.

The first pick with truly interchangeable parts was patented by Ambrose Miller at Hoboken, New Jersey on Jan. 4, 1879 (Fig. 10A and 10B).

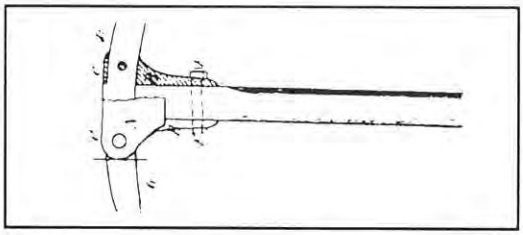

Fig. 10A In 1879 Ambrose Miller patented this mechanical pick. He let the patent lapse and the Eyeless Tool Company filed it in 1894. As the photo of the Eyeless Tool Company's railroad pick and poll pick illustrates, the design was intended to have interchangeable tines, which were riveted between the two plates (Author). The 1879 and 1894 patents were cast into the handle shanks. The Eyeless Tool Company formed in 1894 in New Jersey and successfully made hand tools for a number of decades (New York Office of Corp. Records). Quite rare, Eyeless picks have been seen from Nevada to Colorado.

Fig. 10B

Because of the special parts and machining, mechanical picks were, in the short run, more expensive to purchase than their one-piece counterparts. This put them out of reach economically from most coal miners, who were chronically, notoriously underpaid, but they were well-suited for larger mining companies who, hypothetically, would only have to buy enough units to fulfill their immediate need and supply extra tines or points to keep them in continuous use. In the long run this made economic sense because extra tines or points were cheaper to buy, sharpen, and store than entire pickheads.

The number of mechanical pick patents reached its peak between 1890-1915 with approximately 1 to 2 filed per month; by the 1920's the frequency dropped to only several per year. It is unknown how many mechanical picks were actually sold on the market, and what is clear is that a large number of unpatented models were produced, indicating a fair demand in the pick market. The upswing of mechanical patents from the 1870's into the 1900's reflects the trend of increasing innovation and mechanization in North American mining during this time, and the drop off in the 1920's may reflect a change in mining toward heavy mechanization and away from labor intensity.

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4. Secretary of State,
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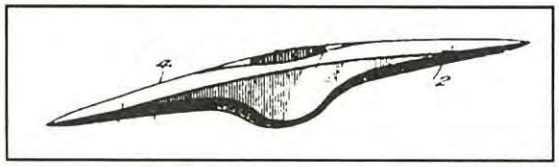

Figure 11. The author has seen a sample of this odd design in a Colorado coal field antique shop. It was one of the few nonmechanical pickheads patented, in this case by John Chevellard in Millersburg, Ohio in 1904. (Pat. 198,277)

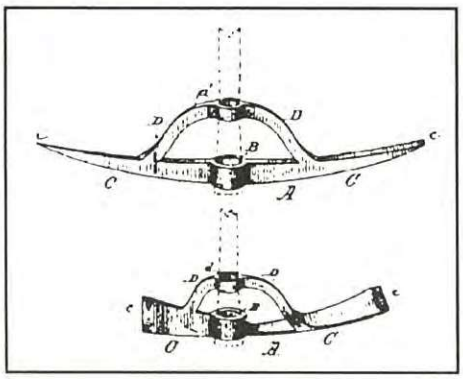

Figure 12. Was this odd pickhead ever made? The compound shape could only be created if the arched handle brace was forge-welded onto the body or if the entire pickhead was cast. The arched brace reinforced the handle's' weakest spot which was where it joined the pickhead. The drawbacks to this design were that it required a special handle and it was more expensive to make than simpler counterparts. (Pat. 369,921)

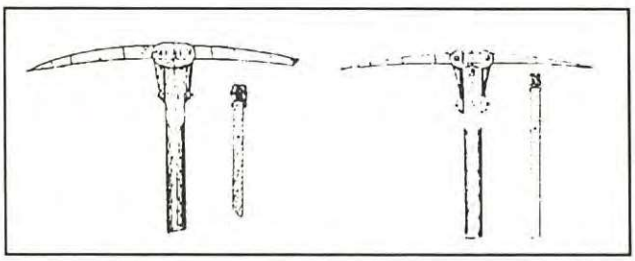

Fig. 13 These mechanical picks, variations of Miller's 1879 patent, were patented by the Eyeless Tool Company in 1892. The fact that patents were renewed in 1894 suggests they reached production. (Pat. 524,818; 524,819).

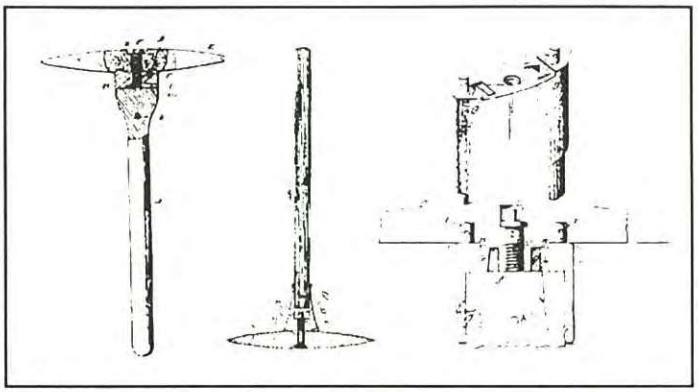

Figure 14. This series of patent drawings illustrates a common trend with mining equipment whereby a series of inventors improved or altered previous designs. In the case of these mechanical coal picks, the first design was patented by Andrew Moats in 1886, the second in 1888 by Hiram Stouffer, the third by Isaac Price and John O'Mealia in 1900, and there are other variations not shown here. Most of the differences are in the handle shanks, allowing the tines to remain interchangeable between the models. Relatively common interchangeable tines would have made these coal picks more marketable. (Pat. 356,512; 400,803; 659, 101).

Figure 15. An exploded view of yet another variation of the Moats design, and sharpened replacement tines. Its manufacturer is unknown, and it has "1 11 12" cast into its handle flange. At some point this design was purchased by the Hardsocg Mfg. Co. which replaced the "1 11 12" with "Hardsocg". This design is probably the most common historic pick existing today.

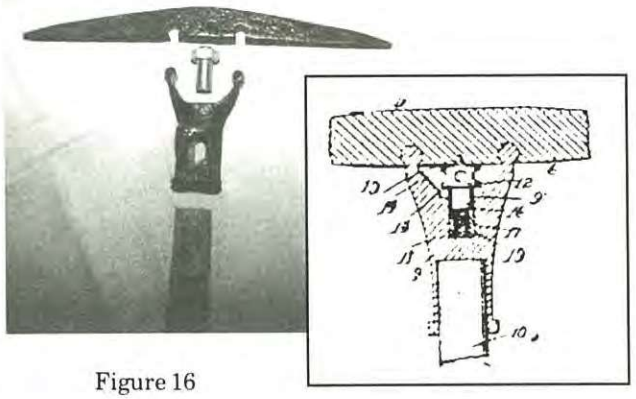

Figure 16

Figure 16. Compare the patent drawing of this mechanical coal pick, patented in Hocking, Iowa by Alfred Bohy in 1912, with the photo of the production model-there is very little difference. The handle shank is made of cast iron and subject to breaking, as indicated by the brazened fractures on the production model and the points on its tines are forge-welded hardened steel. Its maker is unknown. (Author; Pat. 1,022,924)

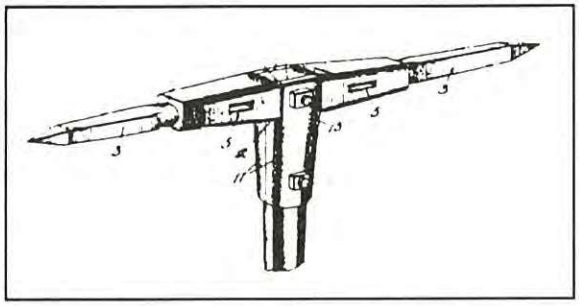

Figure 17. Looking more like a machine, this mechanical coal pick was patented by Bud Laughhunn in Centralia, Illinois in 1904. The handle bolted on and the points had tapered butts that fitted into corresponding sockets in the ends of the tines. To remove them a blacksmith pounded hardened steel wedges into the slots in the tines, pushing the points out. A fascinating but expensive design. (Pat. 773,507)

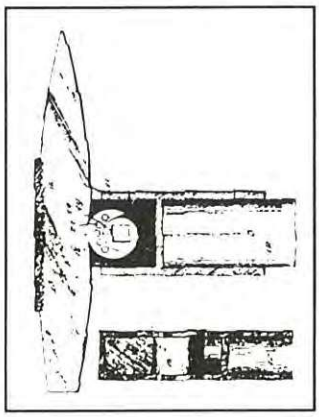

Figure 18. Another Martin Hardsocg patent, this one granted in Ottumwa, Iowa in 1903.The top of the tine was forced against the toothed plate by a cam turned with a wrench. Although this pick would have been costly, the tine could have been changed in seconds. Was this model ever made? (Pat 759,704)

Fig. 19

Figure 19. This mechanical coal pick features push-in points and partly machined and partly welded construction. The welds suggest post-1920's manufacture. Cast into the handle shank is "Blowdil", presumably its maker. Models identical to this, and others with screw-in points were also made by Hardsocg. Samples of the Hardsocg version have been seen from Pennsylvania to Colorado.(Author)

Figure 20. The maker of this mechanical railroad pick from Jackson in California's Mother Lode is unknown and it was not patented. When assembled, the notch in the top of the tine seats against a corresponding pin, and the entirety is bound with the steel wedge. (Author)

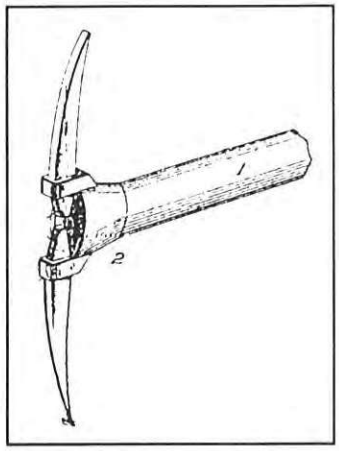

Figure 21. The Author spotted this mechanical railroad pick several years ago in Columbia State Park in California's Mother Lode. It was patented by George Lucas in 1899 in nearby Valley Springs and was another design that made it into production. The tines of the production model were longer than most other railroad picks, suggesting it was intended for prospecting or placer mining. (Pat. 646,441)

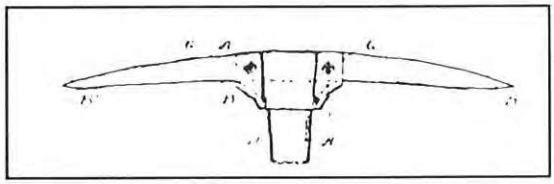

Figure 22. George Singleton's 1898 drift pick patent was another design that saw production; one being seen by the Author in a Colorado mining town antique shop. This design was very practical with the handle shank bolting to a one-piece tine. (Pat. 613,729)

Figure 23. Note the similarity of this mechanical pick to the Eyeless model-construction is nearly identical, but it is unpatented. It probably also had interchangeable tines. The logo cast into the bracket is that of the Ames Tool Co. which operated in the early part of the 20th century. (Author)

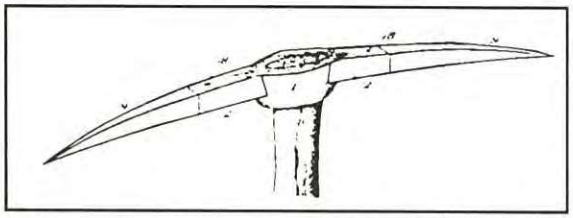

Figure 24. William Kelso of Butte, Montana, patented this drift pick in 1897. Like Walton's 1873 patent, the butts of the points fitted into sockets in the ends of the tines. Kelso's design called for malleable iron pins instead of set screws to hold them in place. The draw-back was that a blacksmith had to extract them to change points. (Pat. 588,339)

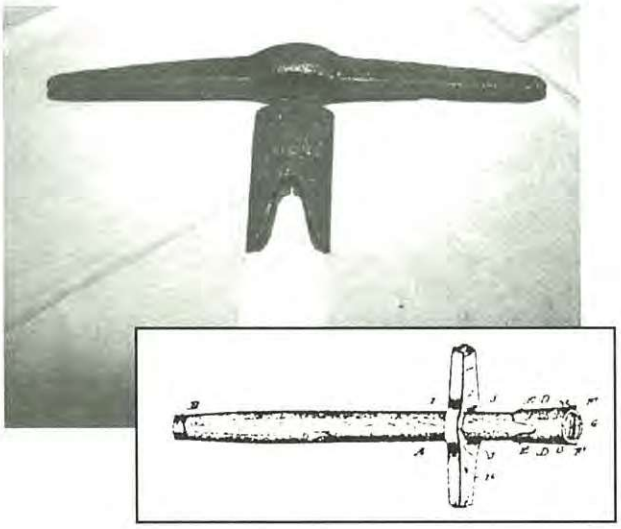

Figure 25. Another approach to changing pickheads without destroying the handle involved an iron sleeve around the pickhead's contact spot, reinforcing it, protecting it from wear, and firmly holding the pickhead. Tinkers and inventors patented less than 10 variations on this theme between 1872-1925, and probably fewer were actually manufactured. John Cook patented the first such pick in 1884 in Drifton, Pennsylvania but the production models were made by Park & Co. in Wigan. The production model is nearly identical to Cook's patent, except "Park & Co." is gang-stamped into the sleeve where the pickhead seats(Pat. 302,109; Author) The double points indicate the pick was intended for mining , and its size could have been used in coal or hard rock.

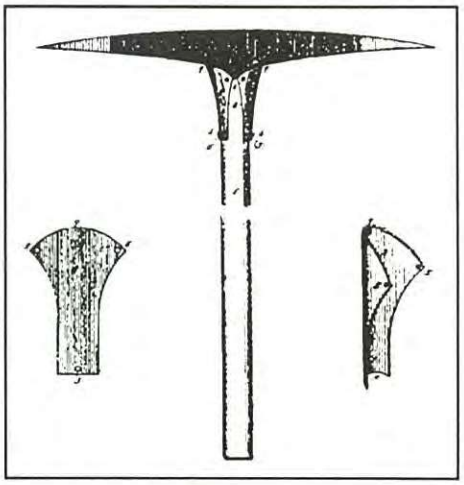

Figure 26. George Schoettle patented a practical two-piece sleeve for mounting Pittsburgh Pattern pickheads in Collinsville, Illinois in 1890. The corners of each plate had holes for screwing to the handle. (Pat. 458,528)

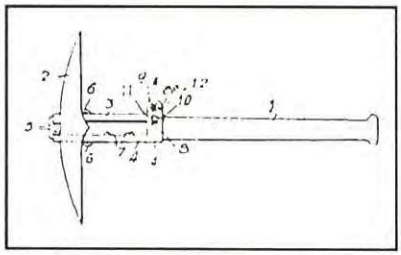

Figure 27. This sleeve for coal picks is a mechanical version which clamped around the end of the handle and featured a locking hasp secured with a bold. Ashbell Willard patented this in Benton, Illinois in 1917. (Pat 1,248,993)

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