CARBIDE LAMPS

Carbide lamps first appeared in the early 1890s. Initially used as carriage lamps, it was not long before carbide lamps were adapted for use in the mines. The lightweight, brass canister and the bright light it produced were soon adopted by farmers and hunters, but the hey day of the carbide lamp was short, lasting only about 20 years. Electric lamps and battery-powered flashlights soon replaced this handy little item.

Frederick Baldwin received the first US patent for an "Acetylene Gas Lamp" in 1900. The design of the carbide lamp consists of two chambers – an upper chamber holding water (H_2O) and a lower chamber filled with calcium carbide (CaC_2). Acetylene gas is produced when water from the upper chamber drips onto the calcium carbide in the base. The amount of water flowing into the lower base can be controlled, with more water producing more gas and a bigger flame when the lamp is lit. The acetylene gas is funneled to the burner where it is lit by a match or a built-in striker. Once the flame is lit, a reflector allows the operator to control the direction of the light.

The carbide lamp incorporated several improvements over the oil-wick lamp and the candle as a means for lighting in the mines. The lamp could easily be attached to a miner's cap. The lamp produced no carbon monoxide, consumed less oxygen, and provided 4 to 6 times more light. Its shortcomings included only a 4 hour burn time, which meant it had to be refilled halfway through a shift. In addition, the burner clogged easily and had to be cleaned several times during a shift.

The limitations of the carbide lamp hindered its adoption. It slowly replaced the miners' candle after 1900 to become very popular after the First World War. By the 1930s battery-powered electric lamps had replaced carbide lamps and they rapidly became collector's items. Today, carbide lamps are enjoying a small revival among spelunkers and as home decorations.