

A Safety Plummet Lamp

by Tony Moon

Certain underground surveying techniques require that a plumb bob line be sighted using a transit. Several ingenious lamps were devised to illuminate the plumb bob line or plummet lamps were used and the lamp flame itself was sighted through the transit. The first reported use of plummet lamps in the United States was in the anthracite region of Pennsylvania in 1871 ⁽¹⁾. The first plummet lamps were made by Heller and Brightly of Philadelphia; they were similar to the one shown in Figure 1. Other surveying instrument manufacturers made or sold similar lamps and the author has seen lamps by Buff, Leitz of San Francisco, and Kueffel and Esser (K and E). Oil wick plummet lamps were still available in 1910 and eventually electric plummet lamps were made.

The open flame plummet lamp could not be used in coal mines where there was a danger of fire-damp (methane). In 1874 a safety plummet lamp was designed and manufactured by Heller and Brightly ⁽²⁾. This lamp is shown in Figure 2. The lamp is similar to a Muesler type in that it has a chimney. Air enters the lamp through four holes protected by double brass wire gauzes mounted in a ring (C) above the flame. A chimney is mounted in the center of the same ring. Air leaves the lamp through the top of the chimney which has a perforated inverted cone lined with gauze and a gauze dome (D). The flame is surrounded by tempered glass. The lamp is made of brass except for the tip of the plumb bob which was probably iron. The lamp was described as "a beautiful piece of work" and is one of the most unusual safety lamps ever produced. This lamp, or one similar to it, was still available in 1913 ⁽³⁾. I have one unconfirmed report that a surviving example is in an instrument collection.

References:

- (1) Raymond, R. W., "Remarks on a mining transit and plummet lamp." Transactions of the American Institute of Mining Engineers, Volume I, 1871-1873.
- (2) Coxe, Eckley B., "Improved form of plummet lamp for surveying in mines where fire-damp may be met with." Transactions of the American Institute of Mining Engineers, Volume III, 1874-1875.
- (3) Durham, E.B., (1913) Mine Surveying, McGraw-Hill, page 33, 1913.

