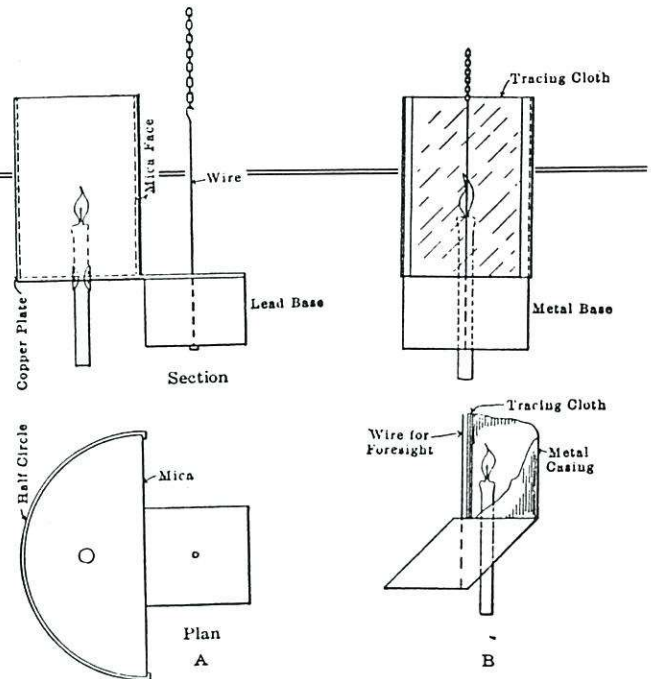


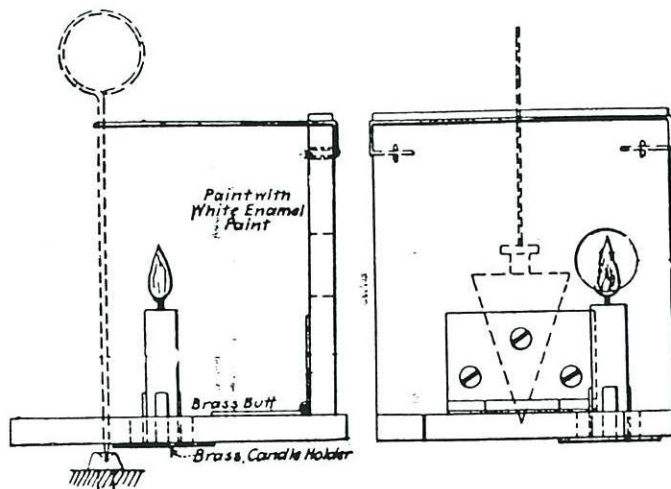
# UNDERGROUND SURVEYING ILLUMINATING THE PLUMB LINE

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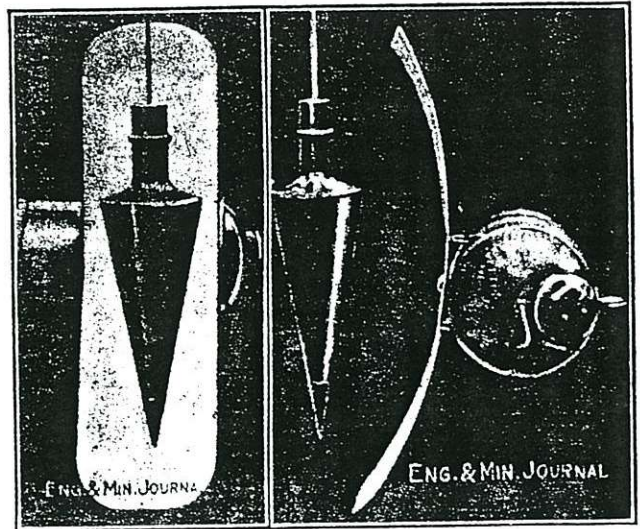
Previous articles in the MAC have detailed various lamps that provide targets for underground surveying, where the flame itself is sighted through the transit. Most underground surveying used an ordinary plumb bob hung from a station in the back (or roof) but this required that the plumb bob string be illuminated. Early pictures show both candles and oil wick lamps being held behind or to one side of the string, and the carbide lamp was used for the same purpose. However, a 1912 article<sup>1</sup> describing the virtues of the "new" acetylene lamp for surveying describes the inherent hazard of using flame lighting to illuminate a string: "The lamp offers one real disadvantage for work around a transit. The intensely hot jet of flame, accidentally licked across the plumb bob cord cuts it instantly. This helps neither the plumb nor the transit." One can imagine the expletives that rang down the tunnel as the plumb bob headed toward the floor!



**Figure 2.** Candleholders known as "Butte backsights," designed to illuminate a surveyor's plumb line. (From L. M. Trumbull's *A Manual of Underground Surveying*, 1910)



**Figure 1.** Candleholder for illuminating a surveyor's plumb line. (From E. B. Durham's *Mine Surveying*, 1913)



**Figure 3.** Simmons-made reflector to adapt to a Baldwin cap lamp for plumb bob illumination. (From *Engineering and Mining Journal*, 1914)

Various ingenious "home-made" devices were used to illuminate the plumb line with candles. Three are shown in Figures 1 and 2. The use of oiled paper, tracing cloth, or ground glass provided a more diffused light behind the string and was a necessity for longer sights. The simplest "lamp," using tracing cloth, was a modification of the tin can "bug" light. Two cans one inside the other with holes cut in the flat bottoms of both were used to hold the tracing

cloth, and the whole device was mounted on a tripod which was then placed behind the string.

The only factory-made lamp that I have found in the literature<sup>2</sup> which was specifically designed to illuminate a plumb bob or plumb line is shown in Figure 3. In 1914 John Simmons offered this special reflector for the Baldwin cap lamp. The reflector was 2 inches wide by 7.5 inches long. It was bent into an elliptical curve and was painted with white enamel.

1. L. O. Kellog, "The Acetylene Lamp Underground," Engineering and Mining Journal, Dec. 12, 1912.
2. "Surveying Reflector for Acetylene Lamp," Engineering and Mining Journal, Feb. 21, 1914.

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## A NEW POWDER COMPANY

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Remnants of a powder box that bear the inscription Monite Explosives Inc., were discovered in a mine last year by Martin Jensen. The company was apparently a short-lived corporation located in Reno, Nevada, that produced explosives locally.

Jensen's research revealed that the company was incorporated January 18, 1927, as the Mineral and Chemical Corporation. Two

months later its name was changed to Monite Explosives Incorporated located at 15 Front Street, Reno, Nevada. No other historical data was available.

A side piece, 17.5" x 8.5", and an end piece, 12.5" x 8.5", of a 50-pound box were recovered which have plain black lettering as shown in the illustrations.

