

oil lamp.

Using the "Cap" or Nonluminous Flame.

The "cap" flame is the most reliable in testing for gas in every-day mine practice, because it may be used without previous adjustment in fresh air. The "cap" flame must be used in testing for gas in return air currents.

To determine accurately the percentage of gas in a mine the "cap" flame must be used, or some measuring device must be placed over the normal flame to indicate the height of the "gas cup" above the luminous flame.

In using the "cap" flame the normal flame should be reduced in size until the yellow color has disappeared, leaving a blue flame, which does not interfere with a good eye seeing the "gas cap" above the flame of the lamp. Some miners have nystagmus and can not easily see the "gas cap." It takes a good normal eye to see the "cap" clearly.

Height of "Gas Cap."

The height of the "gas cap" is a measure of the percentage of gas present in normal mine air, each type of lamp giving different heights of caps; the height for each lamp is governed by the temperature of the flame, which in turn depends upon the nature and the kind of fluid used in the oil vessel or fount.

The Bureau of Mines has undertaken a study of the height of "gas caps" as given by different types of lamps when burning different kinds of fluids. The results of this study will appear in a future publication.

Precautions in Using Safety Lamps.

Certain precautions that should be observed in the use of safety lamps are mentioned below:

1. Be sure the lamp is locked before taking it into the mine.
2. Examine it carefully yourself to see that it is in good condition, even if it has passed the lamp inspector.
3. Do not carry a key or other device for unlocking the lamp.
4. If you have to prepare the lamp yourself, put the parts together carefully; be sure that the glass is not cracked and that the gaskets are good and are properly placed. A slight carelessness in these matters may cost you your life and the lives of others.
5. Do not carry matches into the mine.
6. Do not attempt to open a lamp within a mine unless at a regular lamp station where the rules of the mine permit lamps to be opened and relighted.
7. Do not set your lamp on the bottom of the mine; it may be accidentally upset and extinguished, and the gas globe may be broken. It is better to hang the lamp on a timber by means of a stout nail.
8. Do not use a lamp that has dirt or oil on the gauze.
9. In testing the lamp in the lamp-room tester for its safety in gas, hang it by the handle.
10. In testing for the presence of gas in a mine, hold the lamp firmly by the bowl (fount).
11. In testing for gas be careful to prevent dripping water from striking the glass globe.
12. Do not allow the flame to smoke; soot may fill the gauze and you will have poor light.
13. Before entering a room or a "tight end," examine the flame of your lamp, and as you advance make frequent tests for gas. Make frequent tests during the shift and always before and after firing

a shot.

14. To avoid being left in the dark, fire bosses should carry two lamps, one for traveling and another for testing, unless the testing lamp is equipped with an internal igniter.

15. If possible, avoid testing for gas pockets while shots are being fired; the flame of your lamp may be driven through the gauze the external gas ignited.

16. When gas flames in your lamp, withdraw the lamp slowly and carefully, and if the flame goes out retire to fresh air before attempting to relight it.

17. If your lamp flames and the wick flame goes out, be sure to examine the gauze, because the gas may be burning within the gauze. To put it out, shut off the air supply, or take the lamp to fresh air, if near at hand. Some miners smother it with their clothes, but if the gauze is red hot it may ignite the clothes and may thus fire the gas.

18. Lamps that have not been used for some time often have rusty gauzes, a hardened wick, or gummy oil. Do not take a lamp in such condition into the mine.

19. Having detected gas, do not repeatedly put your lamp into it, but arrange for the removal of the gas by ventilation. One of the accidents mentioned in this circular was caused by putting a defective lamp into the gas immediately after the gas had been detected with another lamp.

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