

THE GARFORTH FLAME SAFETY LAMP

The modern Garforth lamp has been developed by the Safety in Mines Research Establishment from a lamp described by Sir William Garforth in 1883.

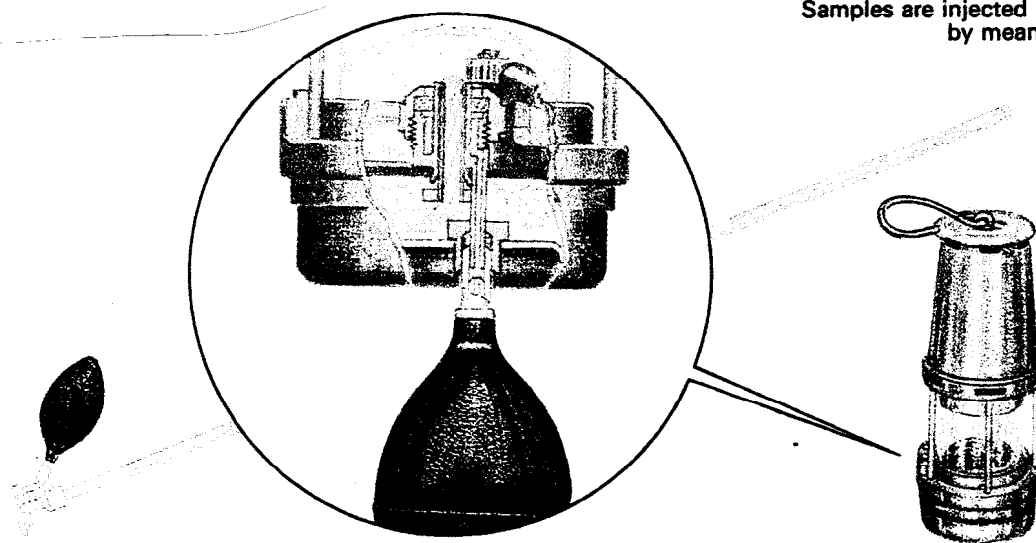
The essential feature of this lamp is that samples can be collected in a bulb then injected into the lamp through an annulus round the wick. By this means, samples can be collected from the roof or from places difficult of access, and then the lamp can be held in a convenient position for observation of the gas cap. Moreover, sampling errors due to convection currents around the lamp are avoided.

For concentrations in the bulb of up to 5 per cent, the gas cap is very similar to that obtained when the lamp is completely immersed in a mixture of the same concentration in the general body of the air.

The Garforth lamp is not extinguished by careful injection of high concentrations of firedamp, but in 'general

body' concentrations, used without the sampling bulb, it behaves as an ordinary safety lamp.

To obtain a sample, the bulb is squeezed as flat as possible and then raised to the position for sampling, either by hand or at the end of a stick carrying a valve. The pressure on the bulb is released and the sample is drawn into the bulb. The bulb nozzle is then inserted into the orifice in the base or side of the lamp, and squeezed to inject the sample in about seven seconds.



Samples are injected into the Garforth lamp by means of an aspirator bulb.

If the point to be sampled is not within arm's reach, the sampling bulb needs to be fitted to a special sampling valve and held at the end of a rod. The valve lever is depressed when deflating or inflating the bulb.

- (a) Set a testing flame.
- (b) Squeeze the bulb as flat as possible.
- (c) Raise it to the sampling position, and allow it to expand.
- (d) Insert the bulb nozzle into the socket in the fuel vessel of the lamp.
- (e) Raise the lamp to eye level.
- (f) Inject the sample in about seven seconds, meanwhile observing the flame:
 - i Up to 4 or 5 per cent firedamp. The cap will be similar to that obtained when the same lamp is used without the sampling bulb, for general body sampling (or only a shade smaller).
 - ii Above 5 per cent firedamp. The shapes of the flames are different from any seen in general body testing (as shown in the illustrations).
 - iii Above 20 per cent firedamp. The flame reaches the top of the glass almost immediately the bulb is squeezed.