

Clearly one of the most important preliminaries to a gold operation should be a careful secreting of the annealing flame, to be sure beyond peradventure that there is not a trace of smoke; that the combustion is perfect. The wick of the alcohol lamp is usually too tight in its tube, and not loose enough in its assemblage of fibres to permit a free flow of the fluid fuel.

Of course, the appearance of a single glow-point at the fibre end of the wick is a certain sign of smoke, and should at once be remedied.

When a lower grade than ninety-five per cent. alcohol is used, the residual fluid, after a few hours' burning, becomes so watery as to lessen combustion, and cause the charring of the wick-end.

The sight of a blackened wick-end leaves no doubt as to the probable character of the annealing and the operative work done by the use of that lamp.

The illuminating gas of divers cities differs in quality, and even in the same city varies from time to time in its heat and light-giving properties; therefore the ordinary Bunsen burner is liable to vary in its degree of combustion; but the habit of closely observing the flame and keeping it regulated to the blue point of complete combustion, will tend to the avoidance of the risk of smudging, the main thing being to be sure that the burner is a good one.

It is well to keep at hand a piece of white porcelain—for instance, a small butter plate—and by occasionally holding it for a minute or two over the flame, gain an assurance of the entire absence of smoke.

When the gas is of a poor quality, the impurities and the gaseous products of their combustion contaminate the gold to a degree incompatible with a perfect welding or cohesion.

The mica method of annealing is preferable, as avoiding all risk of a smudge; but many practitioners are confirmed in the habit of flame annealing, and will probably continue to employ the means to which they have become accustomed, and which, it is believed, may be satisfactorily modified in the particulars herein mentioned.

*Cosmos.*

W. STORER HOW.