

Methods of Lighting Miners' Safety-Lamps by Matches

by Werner Horning

At the end of the last century, when it was required by law to lock safety-lamps, there was the only possibility for miners to re-light their lamps at the pit shaft, or in lighting stations in case they have been extinguished from any cause. At this time an invention of important nature in regard to the re-lighting of miners safety-lamps while locked, has been patented by Mr. Henry Elsom of Bulwell, United Kingdom, which no doubt will prove the inestimable value, not only to colliery proprietors, but also to miners generally.

By this invention, the lamp may be readily re-lighted by a simple and safe process, without in any way infringing the laws regulating collieries in this particular respect. It would be perfectly safe in the hands of all workmen.

The lamp has been thoroughly tested with gas, with the result that it has no effect upon the matches. In all cases ordinary matches or Lucifer's have been used (neither the oil nor the heat of the lamp affecting them), but it is the intention of the inventor to obtain special matches to be used in the lamps.

To illustrate M^r. John Taylor's paper "On Elsom's Improved Method of Lighting Safety-Lamps while Locked."

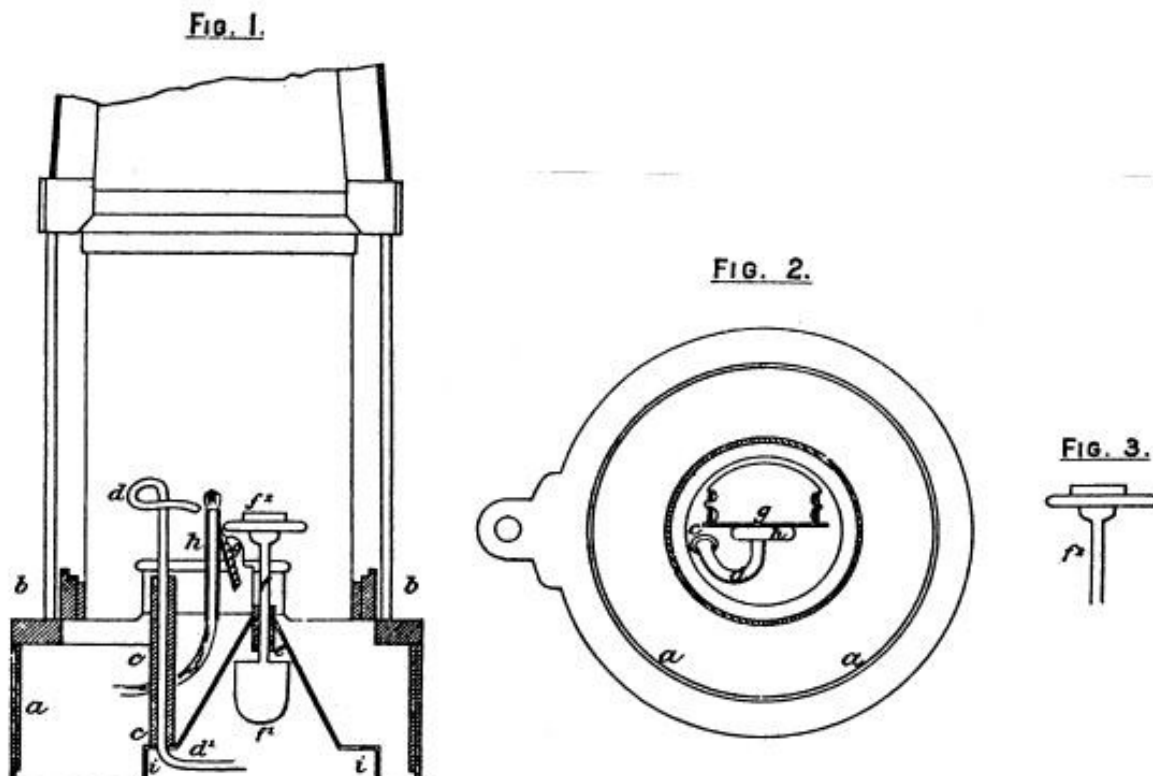


Fig. 1 (previous page) shows a vertical section of a miner's safety-lamp. a is the oil reservoir, which is screwed to the ring b carrying the upper parts of the lamp, and is locked thereto in any ordinary manner; c is a tube which is fixed at the top and bottom of the oil reservoir, and forms a passage for the rod di of the wick trimmer d, which is constructed and operated in the well-known manner; c is a tube which passes through the oil reservoir a on the opposite side to the wick trimmer tube c, and is fixed at the top and bottom of the said reservoir; through this tube c is passed a wire f, which is free to slide vertically; the lower end of the wire f is either bent a right angle to itself, or as shown at fi, it is provided with a milled or other head piece, by which the wire f may be partially rotated and moved up and down when required. To the upper end of this wire f is attached any suitable arrangement of lighting, whereby, when the light in the lamp extinguished from any cause, the wick may be relit by the aid of the lighting means within the lamp, carried by the wire f, which is operated by means of the part f, at the lower end and outside the lamp.

The means of lighting shown in Fig. 3, is only given as an illustration; it is, however, simple and capable of easy management. It consists of a double-ended socket f-2, in which short "Congreve" or matches place; they project a short distance from the socket f-2, and when required, can be turned one at a time toward the roughened plate g secured to the side of the wick tube h, and thereby igniting against the roughened surface. In relighting by this means, the lamp is tilted so as to bring the wick over the match, which is turned towards the roughened surface g and moved up and down until ignited. The socket f-2 is shown to accommodate only two matches, but it may be formed with three or more sockets to receive as many matches.

The reservoir of the lamp is provided with a projecting cylindrical-shaped foot i, to enable the wire f normally to rest with the socket f-2 below the flame in the comparatively cool part of the lamp, thereby preventing accidental ignition of the lighting means. The foot i also protects both rods d-1 and f-1 from injury. When socket f-2 is provided with more than two matches, it may be advisable to place a guard plate between adjacent matches to prevent the flame of one match from accidentally igniting the other.

This lamp was introduced during a meeting of Chesterfield and Midland Counties Institution of Engineers in 1891 and Mr. J. S. Martin (H. M. Inspector of Mines, Bristol) said that in Westphalia there was a lamp in use known as the "**Wolf-Schondorff**" lamp, which could be frequently re-lit. He saw one lighted seven or eight times when it was shown at a meeting of the Manchester Geological Society in March, 1884.

Fig. 2 (previous page) is a horizontal section of the lower part thereof with the improvements applied.

Fig. 3 (previous page) is a side elevation of the upper end of the igniter holder, showing two short matches wedged in it.

German Patents to Ignite Safety Lamps by Matches

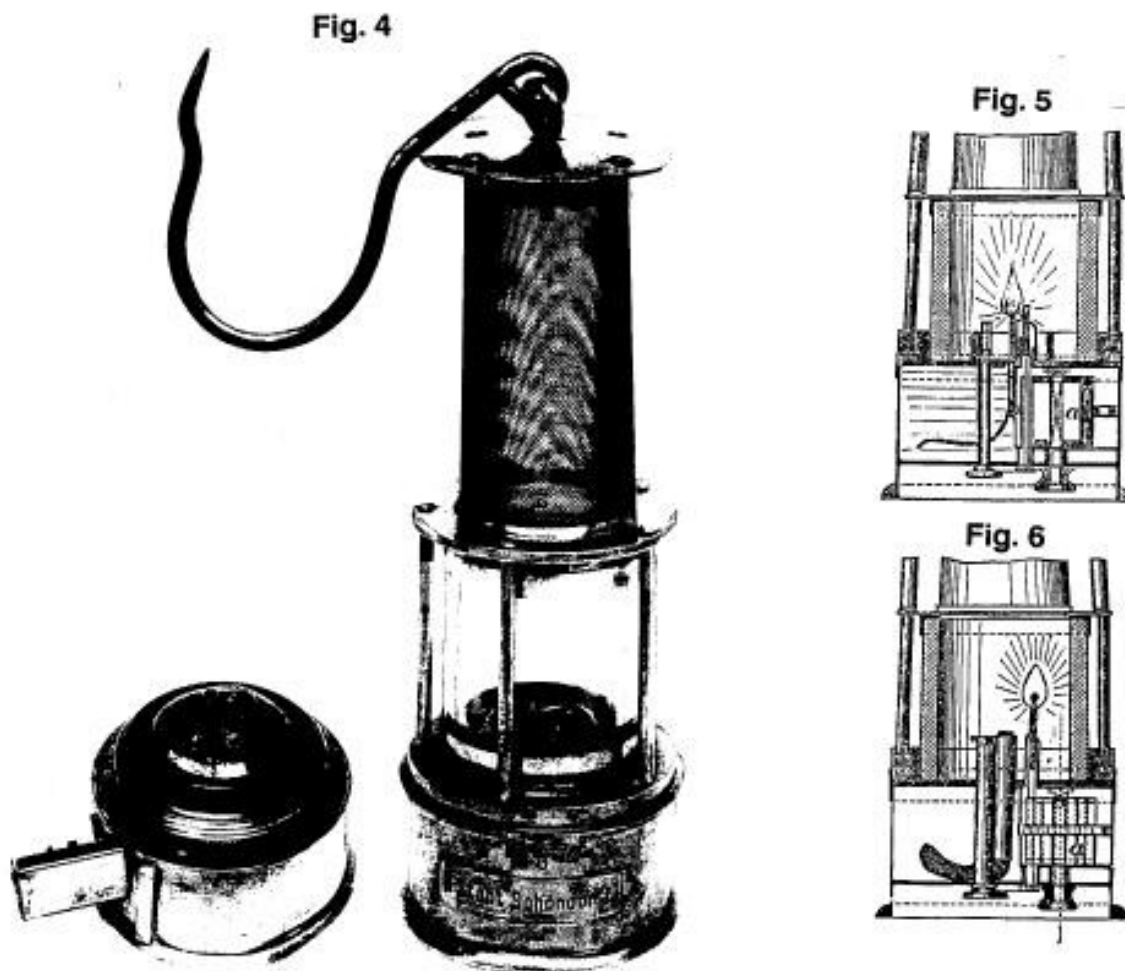


Fig. 4 shows the oil safety-lamp of Wolf-Schondorff with magnetic lock. It was patented in 1890. The lamp can be re-ignited by using matches. The container holding the matches will be interposed lateral into the oil or fuel vessel. Each of the matches can be pushed through by a rod in right position and then can be frictioned by a toothed rod adjacent the wick.

Fig. 5 and 6 show the patent of Feige to ignite the flame in a safety-lamp by matches. The patent also dates from 1890. The drawing shown in Fig. 5 is for oil burning lamps and the one in Fig. 6 for benzine burning.

These lamps are very rare, because they were examined by mine offices and they did not pass through, even if the invention was an useful idea. But the rules were very stringent, and a great deal of trouble was taken to ensure the safety of the miner by only allowing the lamps to be lit by a responsible person.

Reference: Transactions of the Federated Institution of Mining Engineers; Vol. 11 1890-91 / by Taylor 160 Jahre Wetterlampen, Gluckauf, Hubig