

UNITED STATES PATENT OFFICE.

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DETONATING FUSE.

1,049,666.

Specification of Letters Patent.

Patented Jan. 7, 1913.

No Drawing.

Application filed August 9, 1911. Serial No. 643,182.

To all whom it may concern:

Be it known that I, EMIL BURKARD, a subject of the Emperor of Germany, residing at Potsdam, Germany, have invented a new and useful Improvement in Detonating Fuses, of which the following is a full, clear, and exact description.

Igniting tubes have been prepared consisting of a tube charged with trinitrotoluol or trinitrobenzol in liquid state. After the chilling of the nitro body, the tube is drawn to the desired caliber. Fuses are thus produced which when primed with a fulminate of mercury cap detonate with a speed of 5000 to 6000 m. per second. The speed of detonation of a trinitrotoluol fuse is near to 5000 m. while that of a trinitrobenzol fuse is nearer to 6000 m. per second. The trinitrobenzol fuse, as compared with the trinitrotoluol fuse, offers the advantage of a higher speed of detonation, but in the preparation of the former, the difficulty is encountered that to fuse the explosive, it must be heated to a temperature exceeding 120° C., while trinitrotoluol can be liquefied in a water bath at 80°-90° C.

It is undesirable, from the standpoint of safety, to heat the explosive too high, and it is of especial advantage to liquefy the explosive in a water bath.

From the standpoint of efficient priming, fuses with a high velocity of detonation are very advantageous, especially when the detonation waves traveling in opposite directions are to be utilized. From this standpoint, particularly fuses with a higher speed of detonation offer greater advantages than those with a lower speed of detonation, since in this manner the power of initiating detonations which in itself is great is doubled.

From the above it is evident that it is of great advantage to have the explosive used

in the fuse combine the advantages mentioned, that is, a high speed of detonation, and to fuse same in a water bath.

Prior to my discovery trinitrotoluol was the most successful fuse explosive. These nitro bodies have a lower fusing point than trinitrobenzol and yet approach closely the velocity of detonation of the trinitrobenzol.

I have discovered nitro bodies which are fusible in a water bath, produce a greater expansion in the Trauzl lead block than trinitrotoluol and at the same time possess a high speed of detonation. Such explosives are, for instance, trinitrochlorbenzol tetranitroethylanilin.

Detonated under comparable conditions, the following results were obtained.

A fuse charged with—	Melting point.	Expansion in the lead block, ccm.	Velocity of detonation, m. sec.
Trinitrotoluol	81-82°	350	5000
Trinitrochlorbenzol	83°	360	6100
Tetranitroethylanilin	95-96°	390	6200
Trinitrobenzol	121-122°	410	6400

I do not claim herein the use of tetranitroethylanilin as the same forms the subject matter of a separate application filed by me of even date herewith, Serial No. 643,181.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

A detonating fuse containing trinitrochlorbenzol.

In testimony of which invention, I have hereunto set my hand, at Berlin, on this 24th day of July, 1911.

EMIL BURKARD.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.