

UNITED STATES PATENT OFFICE.

GEORGES CLAUDE, OF PARIS, FRANCE, ASSIGNOR TO SOCIETE L'AIR LIQUIDE (SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE), OF PARIS, FRANCE.

EXPLOSIVE CONTAINING LIQUID AIR OR OXYGEN AND LAMPBLACK.

1,131,994.

Specification of Letters Patent.

Patented Mar. 16, 1915.

No Drawing.

Application filed December 20, 1913. Serial No. 808,014.

To all whom it may concern:

Be it known that I, GEORGES CLAUDE, a citizen of the Republic of France, residing at 48 Rue St. Lazare, Paris, in the Republic of France, have invented certain new and useful Improvements in Explosives Containing Liquid Air or Oxygen and Lampblack, of which the following is a specification.

10 This invention relates to absorbent material for use in forming explosives with liquid air or oxygen. Such material is usually formed into cartridges, which are dipped into liquid air or oxygen just prior to use, and are then taken out and placed in a blast hole or other operative position. It has already been suggested to employ lampblack as the absorbent material, but its use has been abandoned for the reason that it does not of itself absorb sufficient liquid, and has therefore required to be mixed with an inert substance of greater absorbent power, such as kieselguhr, which, although increasing the absorbent power of the cartridge thus compounded, diminishes the explosive force, since the kieselguhr is chemically inert.

The present invention is based upon the discovery that it is quite possible to employ lamp black alone provided its density is about 0.23 to 0.26. Lamp black of this density can be obtained by the incomplete combustion of naphthalene. A lamp black cartridge of the density above specified absorbs oxygen with such avidity that on being taken out of the bath of liquid oxygen into which it is dipped before use it allows but a few drops of the liquid to drain from it; capillary forces also exert so powerful an action that, notwithstanding the superficial losses by evaporation, the distribution of the liquid oxygen throughout the entire sectional area of the cartridge remains substantially uniform up to the moment of explosion. Consequently the employment of a protecting sheath or casing impregnated with liquid oxygen for the purpose of preventing evaporation from the core is quite unnecessary; the elimination of such a casing constitutes an important simplification.

With the range of densities indicated above it has been found that the lamp black is able to absorb a weight of oxygen (more than four times its own weight) greatly superior to that which would be sufficient for producing exclusively carbonic acid.

It will of course be understood that the lamp black employed should be lighter in proportion as the cartridges are of smaller diameter and according as it is desired to have a longer time available between the instant of withdrawal from the liquid air or oxygen and the instant of explosion. Finally, it has also been found that the explosive force of the cartridge can be increased by incorporating in the lamp black a certain proportion of naphthalene, say from five to twenty-five per cent. In this case, however, the proportion of oxygen absorbed by the naphthalene being much less than that absorbed by the lamp black, while on the other hand the quantity required for its combustion is much greater than in the case of lamp black, the addition of naphthalene is made at the expense of the available duration of the cartridge and is more suitable for cartridges of large diameters.

What I claim and desire to secure by Letters Patent of the United States is:—

1. An explosive cartridge comprising liquid air or oxygen, and lamp black having a density of about 0.23 to 0.26 permeated by said liquid.

2. An explosive cartridge comprising a mixture of lamp black having a density of about 0.23 to 0.26 and naphthalene, and liquid air or oxygen permeating said mixture.

3. An explosive cartridge comprising a mixture of lamp black having a density of 0.23 to 0.26 and naphthalene constituting from 5% to 25% of the mixture, and liquid air or oxygen permeating said mixture.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGES CLAUDE.

Witnesses:

PIERRE HOURLIER,
HANSON C. COXE.