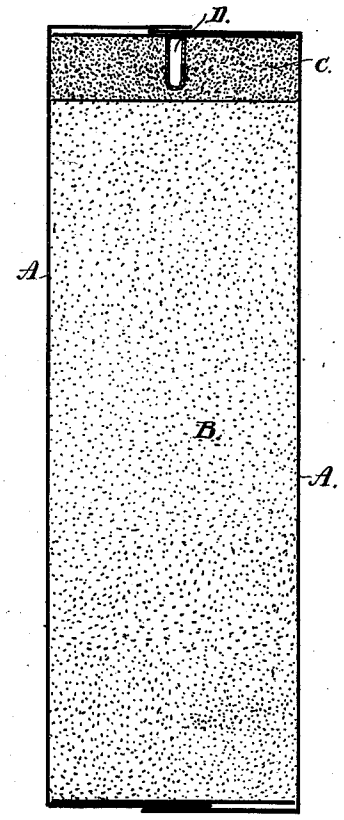
A. C. RAND.
Blasting-Cartridge.

No. 196,767. Patented Nov. 6, 1877.



Witnesses;
Geo. H. Graham
N. S. Munson

Inventor;
Addison C Rand
by
Munson & Philipp
Attorneys.

UNITED STATES PATENT OFFICE.

ADDISON C. RAND, OF NEW YORK, N. Y.

IMPROVEMENT IN BLASTING-CARTRIDGES.

Specification forming part of Letters Patent No. **196,767**, dated November 6, 1877; application filed October 13, 1877.

To all whom it may concern:

Be it known that I, ADDISON C. RAND, of the city, county, and State of New York, have invented certain new and useful Improvements in Cartridges for Blasting; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to cartridges for blasting; and has for its object, first, to protect that class of explosives that are readily deliquescent from the influence of moisture of the atmosphere, or from water when immersed in it, as is common when the cartridge is used in the bore-holes of rocks; second, to effect the detonation of the charges of the cartridge when its main charge is gunpowder, or a composition of one of the lower order of explosive compounds; third, to provide a hollow receptacle in its charges for the ready insertion of the exploder or cap; and the invention consists in the means for accomplishing these objects, as will be hereinafter fully described and claimed.

The drawing shows a cartridge illustrating (as far as this can be done by a drawing) my invention.

A is the envelope for the charges of explosive compounds, made of paper or other suitable material. In this envelope is placed the main charge, such as gunpowder or similar compound, (marked B in the drawing.) At one or both ends of this envelope I place a cover-charge, (marked C in the drawing,) preferably of an explosive material, of a waterproof character, or one that is less subject to the influence of moisture than the main charge.

This cover-charge I prefer to make, for economical reasons, of a compound of twenty-five per cent. of nitro-glycerine and seventy-five per cent. of gunpowder.

Heretofore it has been the practice to work a hole in the end of the charge for the insertion of the exploder or cap; and if the powder was frozen it was necessary, before this was done, to thaw the same, even if a small percentage of nitro-glycerine was mixed with it.

To obviate this dangerous and troublesome practice, I place in the cover-charge a hollow receptacle, of suitable dimensions, (marked D in the drawings,) in which the exploder or cap may be readily inserted when the cartridge is to be exploded.

To more fully protect the main charge from moisture, a disk of pasteboard dipped in paraffine may be placed between said main charge and the cover-charge. This also prevents the main charge from absorbing any nitro-glycerine from the cover-charge. To more fully protect the charges from moisture after the ends of the envelope are closed in the ordinary manner, the whole may be dipped into paraffine.

Instead of gunpowder alone for the main charge, a compound of ninety per cent. of gunpowder composition and ten per cent. of nitro-glycerine may be used. The proportions of this compound may also be varied, and as low as five per cent. of nitro-glycerine may be used with ninety-five per cent. of gunpowder composition with good results; or, instead of either of these compounds, one formed in part of nitro-glycerine and in part of some of the gas-producing salts which have been neglected by manufacturers of cartridges for blasting, on account of their deliquescent qualities, may be used. Thus a compound of eighty-five per cent. of a composition made up of seventy per cent. of nitrate of ammonia, twenty-five per cent. of sulphate of soda, and five per cent. of charcoal, with fifteen per cent. of nitro-glycerine, may be used for the main charge.

The proportions of the compound constituting the cover-charge may vary from those above given; and instead of this compound one consisting of seventy-five per cent. of nitro-glycerine, with twenty-five per cent. of an absorbent material, such as wood fiber, may be used.

By the use of the cover and main charges, as described, the objects above referred to are accomplished, and, in addition, an advantage is obtained in a more ready detonation of the charges and the disruption of a greater amount of rock than if the charges were exploded separately.

Having thus described my invention and the merits it possesses, what I claim as new, and desire to secure by Letters Patent, is—

1. A cartridge for blasting having a main

and cover charge, the latter of which is less readily deliquescent than the former, substantially as and for the purpose described.

2. A cartridge for blasting having a main and a cover charge, the latter of which is less readily deliquescent than the former, with a water-proof disk between the two, substantially as and for the purpose described.

3. A cartridge for blasting having a hollow metal receptacle, D, for the exploder inserted in its charge, substantially as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADDISON C. RAND.

Witnesses:

M. B. PHILIPP,

GEO. H. GRAHAM.