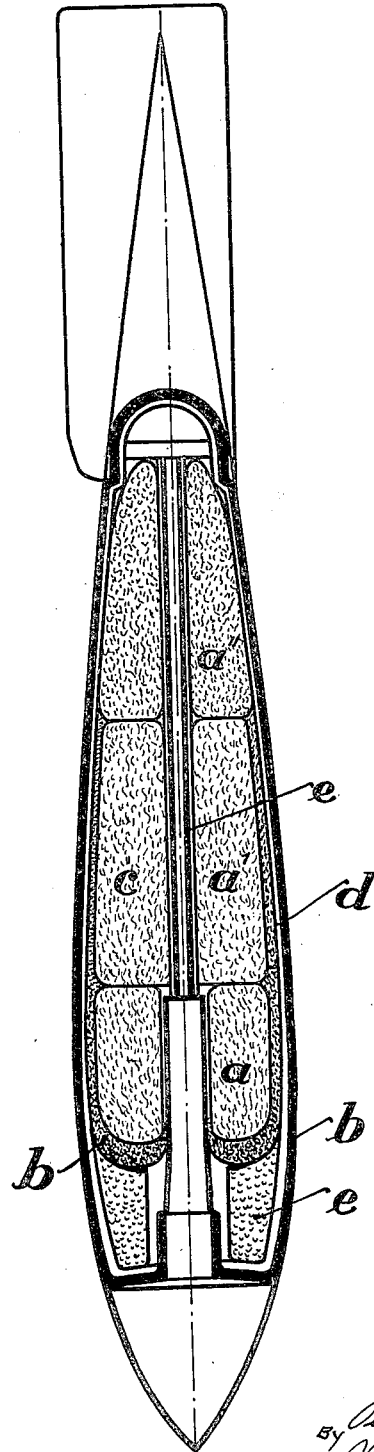


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P. HEYLANDT:  
MISSILE CHARGED WITH LIQUID AIR OR OXYGEN AND A CARBONACEOUS SUBSTANCE.  
FILED JAN. 3. 1921.



INVENTOR:  
*Paul Heylandt*  
BY *Wm. Wallace White*  
ATTY.

# UNITED STATES PATENT OFFICE.

PAUL HEYLANDT, OF SUDENDE, NEAR BERLIN, GERMANY.

MISSILE CHARGED WITH LIQUID AIR OR OXYGEN AND A CARBONACEOUS SUBSTANCE.

Application filed January 3, 1921. Serial No. 434,827.

*To all whom it may concern:*

Be it known that I, PAUL HEYLANDT, a citizen of the German Republic, residing at Sudende, near Berlin, Germany, have invented certain new and useful Improvements in Missiles Charged with Liquid Air or Oxygen and a Carbonaceous Substance, of which the following is a specification.

As the explosive power of the carbonaceous substance, which is generally used in the explosive charge of shells in conjunction with liquid air, increases it exhibits a certain sensitiveness to shock. In order to make the shells insensible to shock in spite of this fact, the explosive is packed in accordance with the present invention in such a manner that the highly explosible carbonaceous substance is enveloped with an explosible substance that is less sensitive to knocks.

This may be accomplished by putting the highly explosible substance into bags which are so arranged in the shell of the missile that hollow spaces occur which are stuffed with less explosible carbonaceous substances such as cork-dust, saw-dust or blasting powder.

Another feature of the invention consists in enabling the liquid oxygen to readily penetrate into all parts of the charge by sub-

dividing the highly explosible carbonaceous contents by putting them in several bags and enveloping them in a loosely-packed, simple carbonaceous substance. 30

The invention is illustrated in the drawing which represents a vertical section of a charged missile, *a*, *a'* and *a''* being three bags filled with a carbonaceous mixture which, in conjunction with liquid air, produces a great blasting effect and is exceedingly explosible. *b* is a layer or envelope of less explosible substance. The cardboard tube *c* is perforated for the purpose of obtaining a more perfect distribution of the liquid air. *d* is an evacuated space and *e* is charcoal for maintaining the vacuum. 45

I claim:

A missile, comprising a shell charged with liquid air, a plurality of bags containing a highly explosible charge of carbonaceous substance disposed in said shell, and loose carbonaceous material enveloping the said bags. 50

In testimony whereof I have signed this specification in the presence of two witnesses.

PAUL HEYLANDT.

Witnesses:

KÜPHE SEECK,  
MAX JABLOWSKI.