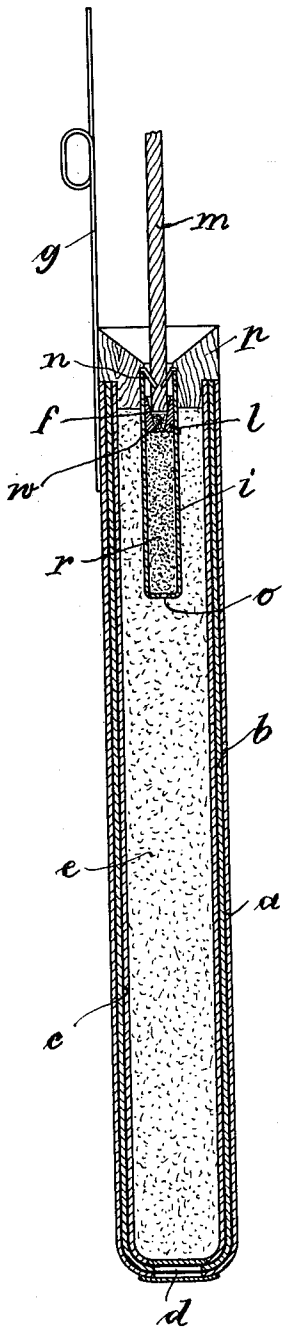
Oct. 2, 1923. 1,469,442

A. MESSER

CARBON CARTRIDGE ADAPTED TO BE USED AS INITIAL IGNITER

Filed Aug. 29, 1921



Witnesses:
W. Smith
Alfred Holzwedel

Inventor:
Adolf Messer
By Fischbach
Attorney

Patented Oct. 2, 1923. 1,469,442

UNITED STATES PATENT OFFICE.

ADOLF MESSER, OF FRANKFORT-ON-THE-MAIN, GERMANY.

CARBON CARTRIDGE ADAPTED TO BE USED AS INITIAL IGNITER.

Application filed August 29, 1921. Serial No. 496,767.

To all whom it may concern:

Be it known that I, ADOLF MESSER, a citizen of the German Republic, residing at Frankfort-on-the-Main, Germany, have invented certain new and useful Improvements in Carbon Cartridges Adapted to be Used as Initial Igniters (for which I have filed an application in Germany December 15, 1915), of which the following is a specification.

The blasting cartridges of liquid oxygen and carbon have been hitherto ignited by the priming caps used also with other explosives. Such priming caps are always connected with certain dangers in their treatment, use, storing and specially in case of miss fires. In the latter case the removal of such priming caps from the blast hole is very dangerous so that generally a new blast hole is made at the side of the old one in order to remove the priming cap which has not gone off. The priming cap might however remain in the material which comes from the mine and become a source of danger.

This invention has for its object to substitute for the liquid oxygen-carbon blasting method a simple, cheap and safe means free from the above mentioned dangers and inconveniencies resulting from the usual priming caps.

The accompanying figure is a longitudinal section of the preferred form of the invention.

It has become known that liquid oxygen-carbon blasting cartridges, if soot is used as carbon, can be ignited in the open air merely by the fuze or quick match and they burn down slowly the same as all the other safety explosives, whilst it can be primed with the quick match alone, without priming cap, when it is absolutely tightly packed, for instance in tightly closed blast holes which have no dangerous hollow spaces, and explodes, developing a very high blasting power.

In order to make the cartridge explode, as is often necessary, also in the open air or in blast holes which are not tightly closed or which have large hollow spaces, the above mentioned blasting process is utilized. In the blasting cartridge consisting of an outer envelope *a* of paper through which neither liquid oxygen nor oxygen vapours can penetrate a small receptacle *b* filled with carbon *e* is arranged whose walls are of paper capable to readily absorb the liquid oxygen and to transfer the same to the carbon filling *e*, said paper being further adapted to let through the oxygen vapours.

This paper capable to absorb the liquid oxygen possesses a good insulating capability and consequently helps to preserve the contents of liquid oxygen in the cartridge. Between the inner sleeve *b* and the carbon filling a layer *c* of a paper may further be arranged which is impermeable for the oxygen vapours. On the one end of the cartridge fabric is attached by gluing which is impermeable for the liquid oxygen and for the oxygen vapours. In the other end of the cartridge a tightly fitting stopper *p* is inserted which is made from incombustible material impermeable for the oxygen vapours. A thin wire *g* fixed on the envelope *a* serves to facilitate the insulation of the cartridge into the dipping vessel. In order that this cartridge may be used as initial igniter the primer *i* is inserted through a central bore of the plug *p* into the carbon *e*. This primer consists of a strong paper sleeve which has a narrow hole *o* in its bottom plate, a small plug *l* being glued into the other end. The plug *l* has a conical bore *f* which is very narrow at its shortest diameter. The primer is filled with soot *r* or carbon, the conical bore of the plug *l* being filled with easily combustible wool *w*. A device *n* made from thin sheet metal serves for holding the fuze *m*. This device *n* is fixed in the stopper *p* and consists of several elastic pointed tongues which securely retain the fuze *m*. If the cartridge is being impregnated with liquid oxygen this liquid oxygen flows through a narrow hole *o* into the primer *i* and impregnates the soot *r* in the same. After the contents of the cartridge has been thoroughly impregnated with liquid oxygen the fuze *m* is pushed through the holding device *n* into the conical bore of the plug *l*. The fuze transfers the ignition upon the easily combustible wool in the conical bore *f* and by this wool the ignition is transmitted to the carbon in the primer *i*. Owing to the resistant strong paper envelope of the primer *i* and owing to the narrowness of the hole *o*, the narrow bore of the plug *l* being clogged by the fuze, the pressure produced by the rapid combustion of the soot in the primer *i* is considerably increased so that a violent explosion of the primer takes

place, wherefrom results the vehement explosion of the cartridge.

If the cartridge should be accidentally ignited at the other end it would burn down slowly without exploding as the explosion can be initiated only by the ignition of the primer.

The priming receptacles of the cartridges are not filled with hydrocarbons as these explode in liquid oxygen also without being enclosed and consequently do not possess the safety of the slowly burning carbon.

At miss fires a short time must be waited until the oxygen of the cartridge in the blast hole has evaporated and escaped, whereafter the cartridges consist only of incombustible absolutely dangerless carbon so that they can be removed from the blast hole without any danger.

This priming method can be used also with all explosives of similar effect.

I claim:—

A carbon cartridge adapted to be used as initial igniter comprising in combination an envelope of a paper impermeable to liquid oxygen or to oxygen vapours closed at one end and open at the other end, an inner sleeve of a paper which readily absorbs liquid oxygen, is of good insulating capability, and lets through the oxygen vapours, a charge of carbon in said inner sleeve, a stopper tightly fitting into the open end of said envelope made from incombustible material which does not let through the oxygen vapours said stopper having a central bore, a primer inserted into this central bore of the stopper so that it projects into the charge of the cartridge and consisting of a sleeve of paper possessing great resistance said sleeve having a narrow hole in the bottom plate, a small plug glued in the upper end of said primer, and having a conical bore with a very narrow lower end, a charge of soot in said primer, a charge of easily combustible wool in said conical bore of the plug, a holding device in said central bore of the plug consisting of elastic pointed tongues of thin sheet metal and a fuze inserted into the primer and securely held by said device.

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

ADOLF MESSER.

Witnesses:

JOSEF KNIEHASZ,

BERNHARDT RINSER.