# UNITED STATES PATENT OFFICE.

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## TREATMENT OF CARBID.

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*To all whom it may concern:*

Be it known that I, ALBERT R. FRANK, a subject of the German Emperor, residing at Berlin, Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in the Treatment of Carbid; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to maintaining carbid fines of substantially full strength so that they will be suitable for use for industrial purposes.

In producing metallic carbids, for example, the carbids of calcium, barium, strontium, carbids of the alkaline earths or of alkalies, the product is obtained in large blocks or pieces in which form it is unfit for use for lighting and other purposes and has to be crushed or broken and this crushing or breaking is now done in any suitable apparatus such as by rock crushers, crushing mills or the like in order that the comminution will be of the size required for commercial purposes. This crushing operation is now carried out with free access of atmospheric air to the carbid so that the moisture contained in the air as well as the oxygen of the air causes carbid to decompose producing an admixture of the oxid or the hydrate, or both, of the metal from which the carbid is formed and this is especially the case with the fines so that these fines are of a much lower degree of purity than the larger pieces, so much so, that they can not at present be utilized for any purpose. Furthermore, in reducing carbids to the state of fine powder it not only deteriorates by contact with the air but explosions often arise with great personal danger to the attendants and considerable loss in machinery. The resulting carbid fines, either in a powdered condition or a fine granular condition, have been found to have decomposed to such a degree that the content of the carbid is only two thirds to one half and less, of the original carbid content.

By the present invention, I avoid all of these disadvantages and am enabled to obtain carbid of a high percentage of purity, in any desired degree of fineness whether carried but by a single crushing operation or by successive crushing or comminuting operations in which case the protecting gas can be passed through the several apparatus in succession and in order to accomplish this, I carry on the process of comminution or crushing in an atmosphere of an inert gas by allowing only such gases to have access to the comminuting or crushing apparatus as do not ordinarily decompose the carbid or enter into combination with it. For this purpose any suitable gas that does not combine or react with the carbid can be used and I have found the following gases to be particularly well suited for the purpose; nitrogen, hydrogen, carbon monoxid, carbon dioxid, furnace gases, generator gases, water gas or producer gas, all of them as dry as possible or even carefully dried air or a mixture of any of the aforementioned gases. If practically all the moisture is taken from the air the oxygen content thereof will have but a very slight decomposing action on the carbid. The process of comminution may be carried out in any of the well known apparatus suitable for the purpose and such as are now sometimes used, for example by means of crushers, ball mills, roller mills, or other similar crushing devices. The atmospheric air is excluded from these machines as much as possible and the crushing operation takes place in the atmosphere of the protecting or inert gas as above set forth.

The crushing sometimes takes place at a high temperature that is before the cakes of carbid have been cooled down after leaving the electric furnace in which they have been produced and in this case when the carbid is crushed hot, I prefer to use as a protecting atmosphere an atmosphere of nitrogen, preferably dry.

I claim:

1. The process of obtaining carbid fines containing a high percentage of carbid, which consists in comminuting the carbid while surrounded by an atmosphere of an inert, non-hygroscopic protecting gas free from oxygen and which at the temperature at which the carbid is comminuted will not decompose the carbid or enter into chemical combination with it.

2. The process of obtaining carbid fines of a high percentage of purity which comprises comminuting the carbid in an atmosphere of a non-hygroscopic protecting gas whose essential constituent is nitrogen.

3. The process of obtaining carbid fines of

a high percentage of purity which comprises surrounding the carbid during comminution by an atmosphere of nitrogen.

4. The process of obtaining carbid fines which comprises comminuting carbid at temperatures above normal while surrounded by an atmosphere of nitrogen.

5. The process of obtaining carbid fines which comprises comminuting the carbid at a temperature above normal in an atmosphere of an inert gas that will not decompose the carbid.

6. The process of producing carbid fines free from cakes or lumps which comprises comminuting the hot carbid from the carbid furnace in an atmosphere of nitrogen.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

ALBERT R. FRANK.

Witnesses:
FRIEDRICH C. MUNDT,
HENRY ORTH, JR.