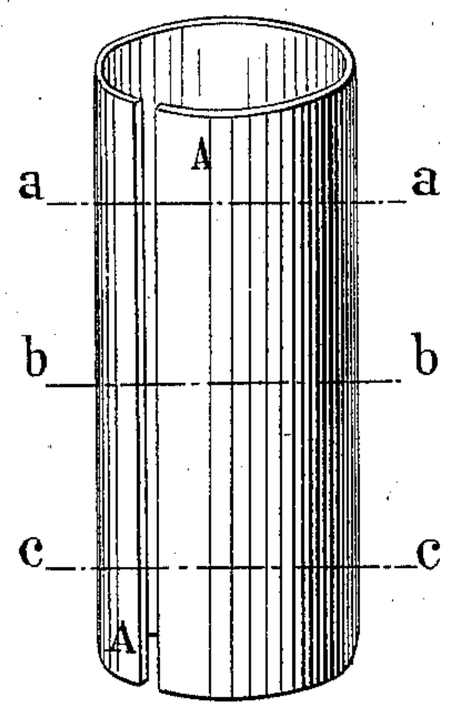
(No Model.)

G. DE R. DE SALES.

CARBID CARTRIDGE.

No. 603,971. Patented May 10, 1898.



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UNITED STATES PATENT OFFICE.

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CARBID-CARTRIDGE.

SPECIFICATION forming part of Letters Patent No. 603,971, dated May 10, 1898.

Application filed February 10, 1897. Serial No. 622,833. (No model.) Patented in France October 9, 1896, No. 260,580; in England January 21, 1897, No. 1,653; in Switzerland January 21, 1897, No. 13,882; in Hungary January 21, 1897, No. 8,604; in Belgium January 21, 1897, No. 125,856; in Russia January 23, 1897, No. 1,051; in Austria March 13, 1897, No. 871, and in Italy April 12, 1897, LXXXV, 478.

To all whom it may concern:

Be it known that I, GEORGES DE ROUSSY DE SALES, a citizen of France, and a resident of Lyons, in the Department of the Rhone, France, have invented a new and useful Improvement in Carbid-Cartridges, (for which I have obtained Letters Patent in France, No. 260,580, dated October 9, 1896; in Great Britain, No. 1,653, dated January 21, 1897; in Austria, No. 871, dated March 13, 1897; in Switzerland, No. 13,882, dated January 21, 1897; in Hungary, No. 8,604, dated January 21, 1897; in Italy, No. 478, Vol. LXXXV, dated April 12, 1897; in Belgium, No. 125,856, dated January 21, 1897, and in Russia, filed January 11 and 23, 1897, No. 1,051,) of which the following is a specification.

My invention consists in a cartridge for agglomerating metallic carbids by surrounding them with a substance impervious, (or nearly so,) in order to preserve them intact till required for use, and also at the same time to regulate the evolution of the gases which they give off when brought into contact with water or other liquids.

The invention is specially applicable to carbid of calcium for use in the production of acetylene gas.

In carrying out my invention I agglomerate such bodies in a suitable form, constituting an article of commerce which I call "acetylene-cartridges." These cartridges are made in the form of a sheath or casing of cardboard, paper, or metal capable of containing pieces of calcium carbid and designed to prevent the latter from expanding or swelling by regulating the action of the water or other liquid thereon. The mode of manufacture hereinafter described is equally applicable to any other metallic carbid.

I ram a sufficient quantity of calcium carbid, in pieces of a size proportionate to the desired yield of gas, into a rigid sheath or casing A. This sheath or casing, which is shown in the accompanying drawing, may be made of zinc, tin-plate, varnished cardboard, waxed paper, or other suitably-prepared impervious material. The said sheath or casing is open at its two ends and is split longitudinally from end to end. I fill the interstices between the pieces of calcium carbid in such casing with ordinary bitumen mixed with tallow (about thirty per cent. to fifty per cent.) or fine-grain sand, so as to render it less brittle. I thus obtain an agglomerate which, by reason of the imperviousness of the sheath or casing, is preserved free from damp and in the interior of which the filling material insures the contact between the several pieces of carbid, while preventing the existence of empty spaces between such pieces. The purpose of the longitudinal slit is to enable the water to penetrate to the interior layers *c c a a b b*. If the sheath or casing were not provided with the slit, the lime produced by the reaction would form a cushion which it would be difficult for the water to pass through. (Such undivided casings may, however, be employed when it is desired to obtain a very slow action.) Moreover, it enables cracks or openings to be formed at *c c a a b b* in the filling material, so as to facilitate the escape of gas which has been liberated, and thus accelerates the action of the water. In order to obtain a very quick action, it is advisable to use only sand for filling in. After having completely filled the said sheath or casing the two ends thereof and the slit are covered with paper previously rendered impervious, which is slit or cut at the moment the cartridge is to be used, or waterproof fabric (which has been treated with tar, for example) may be employed for the same purpose, and which can be torn off when the cartridge is required for use.

Cartridges for rapid action (two hundred to three hundred liters per hour) may be provided with several slits, and the cartridge-casing is in this instance preferably made of wire-netting.

In every case care must be taken to guard against the expansion and the separation of the pieces of carbid which must be kept in contact with one another and covered in.

The following substances are the most suitable filling materials: tar, for very slow action; bitumen, for slow action; sand, such as used for pottery, (*sable de gres*,) for rapid ac-

tion. Generally speaking, the materials suitable for this purpose are those which do not contain water and which solidify by cooling and not by evaporation. The arrangement adopted allows the water to act only in succession on the several pieces of carbid contained in the cartridge and with more or less rapidity, according to the imperviousness of the filling material employed and to the size of the openings in the cartridge-casing—viz., the slit and diameter.

It should be noticed that this manner of agglomerating carbids is entirely different from any process called "coating," as the use of coated pieces of carbid would prevent the action of the water between it and those in contact with it. Far from being coated, some of the pieces present large surfaces of contact with each other, and it is clear that a cartridge containing coated pieces of carbid would be unsuitable for producing gas. In cartridges filled, say, with compressed fine sand the part played by the filling material in preventing the formation of water-pockets is obvious, but clearly the placing of pieces of carbid into sand cannot be called coating. The sand and pieces of carbid rammed into the cartridge constitute an agglomerate.

What I claim as my invention is—

As an improved article of manufacture, the herein-described carbid-cartridge, consisting of a rigid sheath or casing provided with openings in the ends and side, a metallic carbid, such as calcium carbid, inclosed in said sheath with an agglomerating material to fill the interstices between the pieces of carbid, and removable waterproof coverings for the openings in the sheath or casing, substantially as specified.

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

GEORGES DE ROUSSY DE SALES.

Witnesses:

GEORGES DELOM,

HIPPOLYTE TASSE.