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PROCESS OF AND SYSTEM FOR SPLITTING HYDROCARBONS
SUCH AS ACETYLENE OR THE LIKE
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Fig. 1.

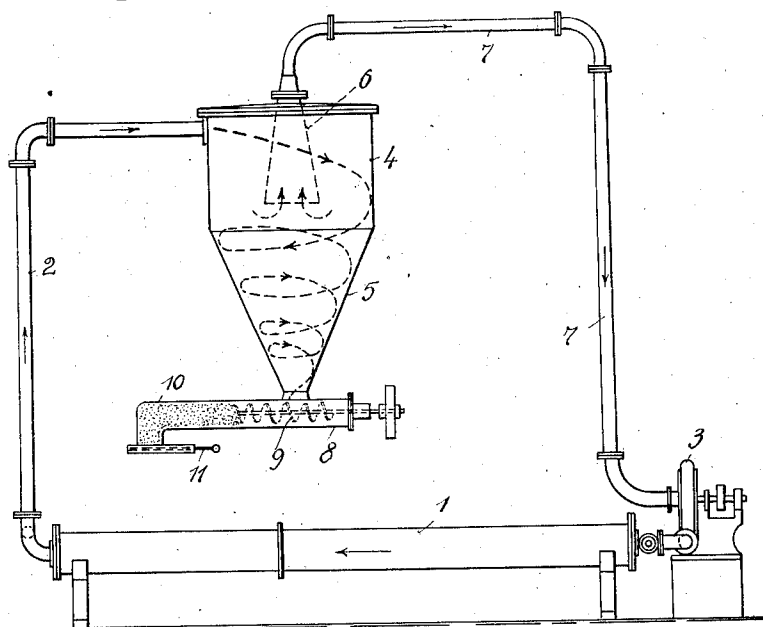
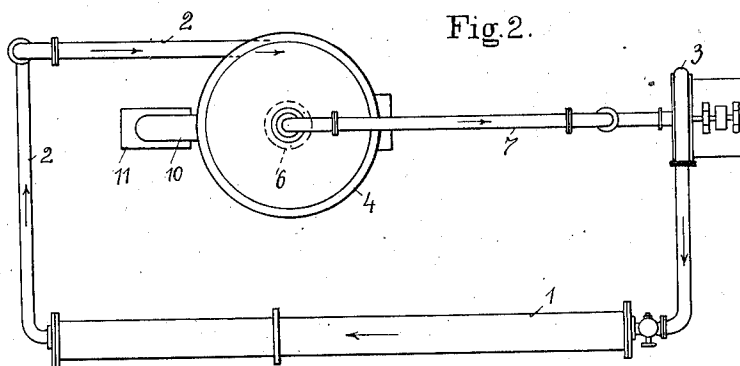


Fig. 2.



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PROCESS OF AND SYSTEM FOR SPLITTING HYDROCARBONS SUCH AS ACETYLENE
OR THE LIKE

Application filed December 9, 1926, Serial No. 153,645, and in Germany September 20, 1924 (abandoned);
also in Germany December 11, 1925.

My invention relates to improvements in the process of and system for splitting hydrocarbons such as acetylene or mixtures thereof with other hydrocarbons in closed receptacles into carbon black or soot and hydrogen, and more particularly to the step in which the carbon black or soot is removed from the receptacle. As is known to those skilled in the art, a residue of carbon black or soot within a receptacle would be liable to cause explosion of a new charge of gas supplied to the receptacle, and it has been difficult to remove the carbon black or soot for the reason that it is not permissible to open the receptacle for cleaning the same by mechanical means, because access of air to the receptacle must be strictly avoided, such air being liable to cause explosion of the new charge and spoiling the gaseous product of the process such as hydrogen.

The object of the improvements is to provide a method by means of which the residue of carbon black or soot remaining within the receptacle after removing the bulk thereof is thoroughly removed without opening the receptacle, and with this object in view my invention consists in first passing the bulk of the mixture of soot or carbon black and hydrogen through an apparatus for separating and collecting the soot, and thereafter blowing the gas or a part thereof which still contains a certain amount of soot through the receptacle, such amount of soot contained within the blast of gas having a function similar to a jet containing sand and thoroughly removing the soot or carbon black from the wall of the receptacle. In carrying out my improved process I prefer to produce a continuous circuit of the gaseous matter and soot, the said gaseous matter and soot being delivered from one end of the receptacle and passed through the soot separating and collecting apparatus, and being thereafter taken from the said apparatus after separation of the bulk of soot for being delivered by a fan or blower into the splitting receptacle at the end opposite to the delivery end thereof. Thereby I am enabled effectively to blow a stream of soot carrying gas several times through the splitting recep-

tacle, until finally pure gas may be passed through the receptacle. It appears therefore that the receptacle is effectively cleaned in a mechanical way without using mechanical cleaning devices permitting the deposition of the soot thereon.

In order that my invention be more clearly understood a system suitable for putting the same into effect has been shown in the accompanying drawing, in which the same letters of reference have been used in all the views to indicate corresponding parts. In said drawing,

Fig. 1, is an elevation showing the apparatus, and

Fig. 2, is a top plan view thereof.

In describing the invention reference will be made to the process of splitting acetylene into hydrogen and soot or carbon black. But I wish it to be understood that my invention is not limited to this process, and that it may be used in connection with other processes for splitting gases into gaseous and solid components.

In the example shown in the figures my improved apparatus comprises a splitting receptacle 1 which, as shown, is in the form of a pipe, a soot separating and collecting apparatus 4, 10 connected with the delivery end of the receptacle 1 by a pipe 2, and a blower 3 having its intake pipe 7 connected with the separating and collecting apparatus 4 and its pressure pipe with the end of the splitting receptacle 1 opposite to the delivery side thereof. As appears more particularly from Fig 2, the pipe 2 opens into the separating chamber 4 in tangential direction, so that spiral or helical movement is imparted to the current of gas and soot or carbon black delivered into the same, so that the bulk of soot is readily separated from the said current and deposited on the wall of the separator 4. The hydrogen which still contains a certain amount of soot flows through a funnel 6 disposed axially of the separator 4 and into the pipe 7, from which it is delivered by the fan or blower 3 into the receptacle 1 thus removing the residue of soot from the said receptacle. The blower 3 remains in operation until the soot or carbon black has

been completely removed from the receptacle 1, and the gas is perfectly separated from the soot, whereupon a new charge of acetylene is supplied to the receptacle 1 and split in the manner known in the art.

5 The soot deposited within the separating apparatus 4 is delivered into a drum 8 connected with the bottom part of the separator, and it is carried from the said drum into the tubular collecting chamber 10 by a conveying worm 9, the said collecting chamber being normally closed by a slide valve 11. The soot collected within the chamber 10 seals the drum 8 and the apparatus 4 against the access of air. After a certain amount of soot has been collected within the chamber 10 the said soot is taken into a suitable receptacle after opening the valve 11.

In some cases I impart whirling movement to the blast of gas delivered by the blower into the receptacle 1. This may be done by providing helical or angular vanes in the portion of the pipe 7 opening into the receptacle 1.

While in describing the invention reference has been made to a particular apparatus for carrying my improved method into effect, I wish it to be understood that my invention is not limited to the construction shown in the drawing, and that various changes may be made in the general arrangement of the apparatus and the construction of its parts without departing from the invention.

What I claim is:—

1. In the process of splitting hydrocarbons in receptacles, the step which consists in separating a portion of the split solid matter from the gaseous matter, and blowing said gaseous matter containing the remainder of the solid matter through the splitting receptacle.

2. In the process of splitting acetylene in receptacles, the step which consists in repeatedly passing the split gas consisting substantially of hydrogen and containing soot in succession from the splitting receptacle through an apparatus for separating the soot and through the said splitting receptacle while gradually separating therefrom the soot within the separating apparatus.

3. A system for splitting gaseous hydrocarbons such as acetylene and mixtures thereof with other hydrocarbons, comprising a receptacle adapted to be filled with the gaseous matter to be split, and to be used as a splitting chamber, separating means connected to said receptacle for separating the dissociated gas including hydrogen and soot from at least a part of the soot, and means connected with said separating means for causing a blast of the said gaseous matter containing a portion of the soot through said receptacle.

4. A system for splitting gaseous hydrocarbons such as acetylene and mixtures thereof with other hydrocarbons, comprising a re-

ceptacle adapted to be filled with the gaseous matter to be split, and to be used as a splitting chamber, a separating means connected to said receptacle for separating dissociated gas including hydrogen and soot from at least a part of the soot, a collecting container connected with said separating means and having an outlet in position for being choked by the soot delivered into the same from the separating means, and means connected with said separating means for causing a blast of the said gaseous matter containing a portion of the soot through said splitting receptacle.

5. A system for splitting gaseous hydrocarbons such as acetylene and mixtures thereof with other hydrocarbons, comprising a receptacle adapted to be filled with the gaseous matter to be split and to be used as a splitting chamber, a separating means for separating the dissociated gas including hydrogen and soot from at least a portion of the soot, a blower, and pipes connecting said receptacle at its opposite ends with the pressure side of said blower and said separating means, and said separating means with the intake pipe of said blower.

In testimony whereof I have affixed my signature.

JOSEF MACHTOLF.