

[54] **METHOD AND DEVICE FOR THE STRIKING OF AN ARC IN A REACTOR**
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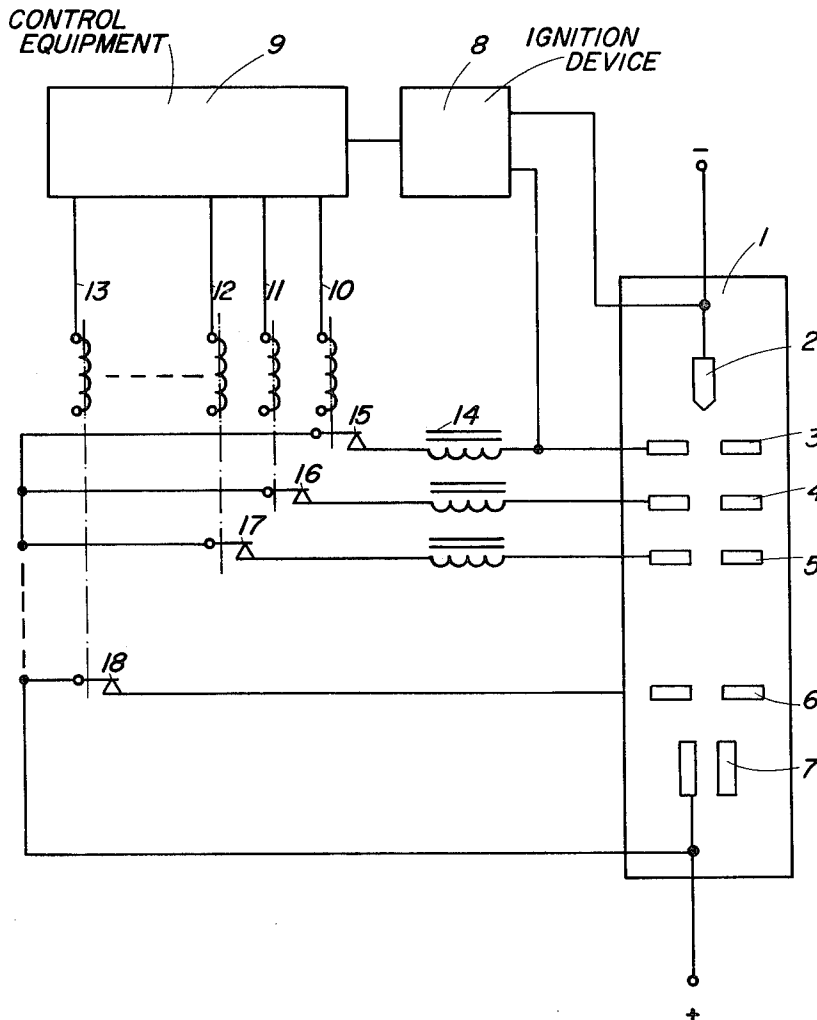
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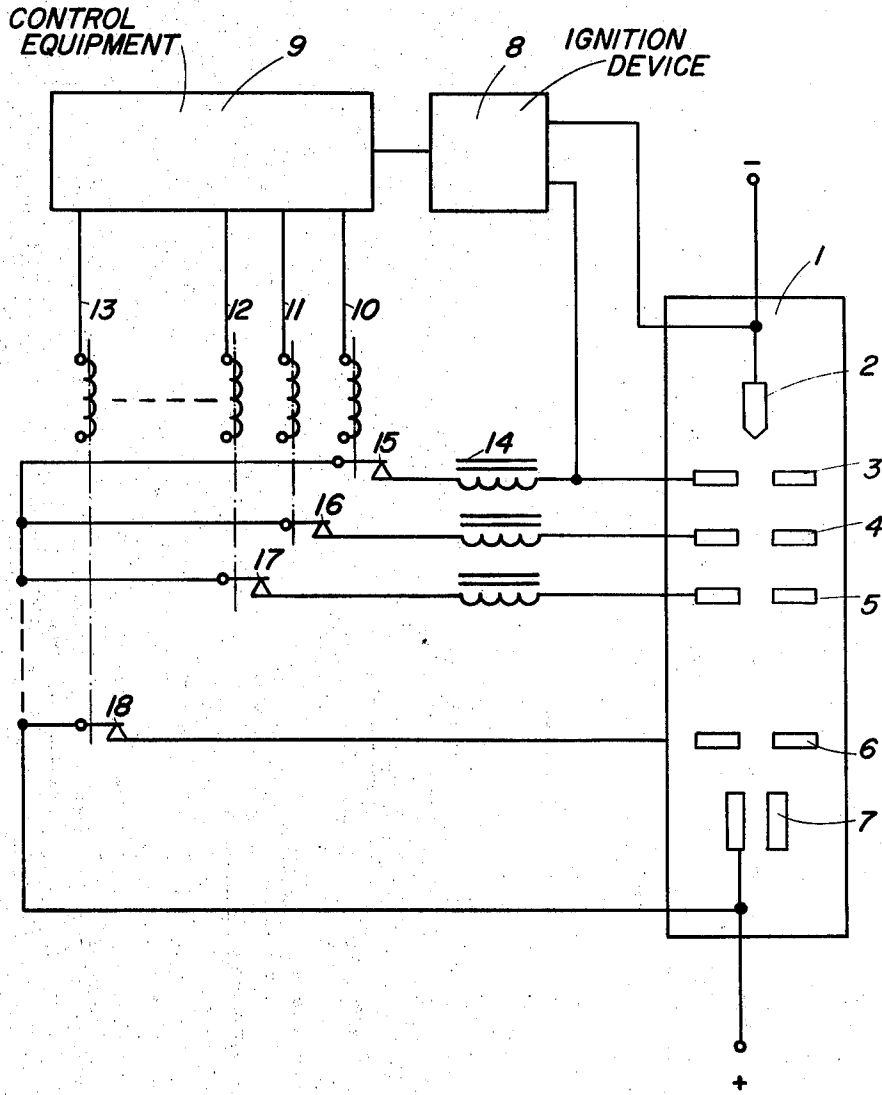
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[57] **ABSTRACT**

The present invention relates to a method and a device for the execution of the method for the striking of an arc between cathode and anode in a reactor for the cracking of hydrocarbons, e.g., for the manufacture of acetylene, the reactor comprising a number of intermediate electrodes arranged between cathode and anode.

4 Claims, 1 Drawing Figure





METHOD AND DEVICE FOR THE STRIKING OF AN ARC IN A REACTOR

BACKGROUND OF THE INVENTION

At the striking of the arc in a reactor for the cracking of hydrocarbons, e.g., at the manufacture of acetylene, problems arise in establishing an arc between the cathode and the anode when the distance between these electrodes is relatively great. It is thus too great for making it possible to achieve a direct discharge between cathode and anode by means of available voltage sources. To make possible the striking, a displaceable auxiliary electrode has been used until now, which at the moment of striking is brought into contact with the cathode and which after an arc to the cathode has been obtained, is moved from the cathode toward the anode until an arc has come into existence between the cathode and the anode. This method requires mechanical devices which are complicated and difficult to handle. Another method that has been applied consisted in the use of a thin wire which connects the cathode and the anode. When voltage is applied between cathode and anode the wire burns off and an arc is formed between the electrodes. The disadvantage of this method consists in that before each ignition process a wire has to be fitted between cathode and anode.

SUMMARY OF THE INVENTION

It is the object of the present invention to provide a method and a device which make it possible to achieve a safe striking of the arc without the aforementioned disadvantages. The method is characterized mainly in that one or more of the intermediate electrodes are given a voltage of the same type as that of the anode, that a striking voltage is applied during a short interval of time between the cathode and the intermediate electrode located nearest the cathode, so that during this interval of time an arc is produced between the cathode and the said intermediate electrode, and that thereafter at certain intervals of time the voltage to the subsequent electrodes is broken, the arc formed being passed on to the subsequent intermediate electrode until the arc reaches the anode, whereby a fully formed arc is obtained between the cathode and the anode.

DETAILED DESCRIPTION OF THE DRAWINGS

In the following the invention will be described in detail in connection with the enclosed drawing which shows an embodiment of the method specified. The FIGURE shows schematically a reactor 1 which comprises a cathode 2, a number of intermediate electrodes 3, 4, 5 and 6 and an anode 7. The cathode and the anode are connected to a voltage source. Between the cathode 2 and the nearest intermediate electrode 3 is connected an ignition device 8 that can be switched on and off. This can consist, e.g., of a high frequency ignition device or a spark discharge ignition device. In the embodiment shown each of the intermediate electrodes is connected via a break contact 15, 16, 17 and 18 to the same pole on the voltage source as the anode 7. The break contacts are worked upon by relay devices which can be constituted of for example the contactors 10, 11, 12 and 13 respectively. The ignition device 8 and the contactors 10 - 13 are influenced by a control equipment 9 which comprises a number of time-controlled coupling members, e.g., time relays. The time relays are arranged so that in the first place a con-

trol signal is transmitted to the ignition device 8 which is switched on during a brief interval of time. During this an arc is formed between the cathode 2 and the nearest intermediate electrode 3. Thereupon the time relays by turn switch on the contactors 15-18. In doing this the voltage is first switched off by the contact 15 to the intermediate electrode 3, as a result of which the arc is passed on to the intermediate electrode 4. The voltage to the electrode 4 is then switched off by means of the contact 16, the arc being passed on to the intermediate electrode 5. In this manner the voltage is successively switched off to the intermediate electrodes, so that when the voltage has been switched off to the last intermediate electrode 6 by means of the contact 18, the arc is passed over to the anode 7. In this manner a fully developed arc has been generated between the cathode and the anode. In the circuits located closest to the cathode a reactance coil 14 is connected between the anode and the respective intermediate electrode. This inductance is so dimensioned that high frequency interferences are suppressed, and that the current is given a suitable rise time.

In the embodiment shown in the FIGURE all the intermediate electrodes are connected to the same pole on the voltage source as the anode 7. It is not always necessary, however, to have this arrangement; it may be sufficient for example to have only one or some of the intermediate electrodes connected to the anode depending upon the distance between cathode and anode. The effect will still be satisfactory with a rapidly developed arc between cathode and anode.

In certain circumstances the cathode can at the instant of striking be advanced towards the anode so that the cathode is enclosed by the nearest intermediate electrode. In this case the ignition device is connected between the two nearest intermediate electrodes and an arc is produced between these electrodes and the cathode. The arc is then passed on towards the anode in the manner as described earlier, as the cathode is moved backwards from the first intermediate electrode.

By means of the method and the devices for the execution of the same mentioned above a striking system has thus been obtained which operates automatically, which is quick and effective and which gives a reliable striking of the arc.

The method described in the foregoing is not limited to a reactor for the manufacture of acetylene but other areas of application are quite conceivable within the scope of the invention. Likewise the device for the execution of the method can be given a different form from that described. Thus the ignition device as well as the making and breaking devices and the control equipment may be given different forms of realization.

What is claimed is:

1. A method for the striking of an arc between a cathode and an anode in a reactor comprising the steps of providing a number of intermediate electrodes arranged between cathode and anode in the reactor, providing the intermediate electrodes with a voltage similar to that provided the anode, applying a striking voltage during a brief interval of time between the cathode and the intermediate electrode closest to the cathode, so that during this interval an arc is produced between the cathode and a first intermediate electrode, and subsequently at certain intervals of time, switching off the voltage to the first intermediate electrode and switch-

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ing on the voltage to the following voltage energized intermediate electrode, the arc formed being passed on to the following intermediate electrode until it reaches the anode, as a result of which a fully developed arc is obtained between cathode and anode.

2. Apparatus comprising a reactor, a cathode and an anode passing within said reactor and spaced one from another, intermediate electrodes spaced one from another along a path between said cathode and anode and spaced from said cathode and anode, control means for applying a common voltage to said intermediate electrodes and said anode, striking voltage control means for applying a striking voltage between the cathode and the intermediate electrode closest to the cathode, and switching means associated with said control means for switching off in time sequential relation the voltage to said intermediate electrodes starting with the interme-

mediate electrode closest to said cathode and then switching off voltage to the next closest intermediate electrode whereby the arc formed between the first intermediate electrode and the cathode is passed on to the next closest intermediate electrode until it reaches the anode, as a result of which a fully developed arc is obtained between cathode and anode.

3. Apparatus in accordance with claim 2 including high frequency damping means operative between each intermediate electrode and said control means to suppress high frequency interference and to give a suitable rise time to current in the intermediate electrode circuit.

4. The device in accordance with claim 3 wherein said high frequency damping means is an inductor.

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