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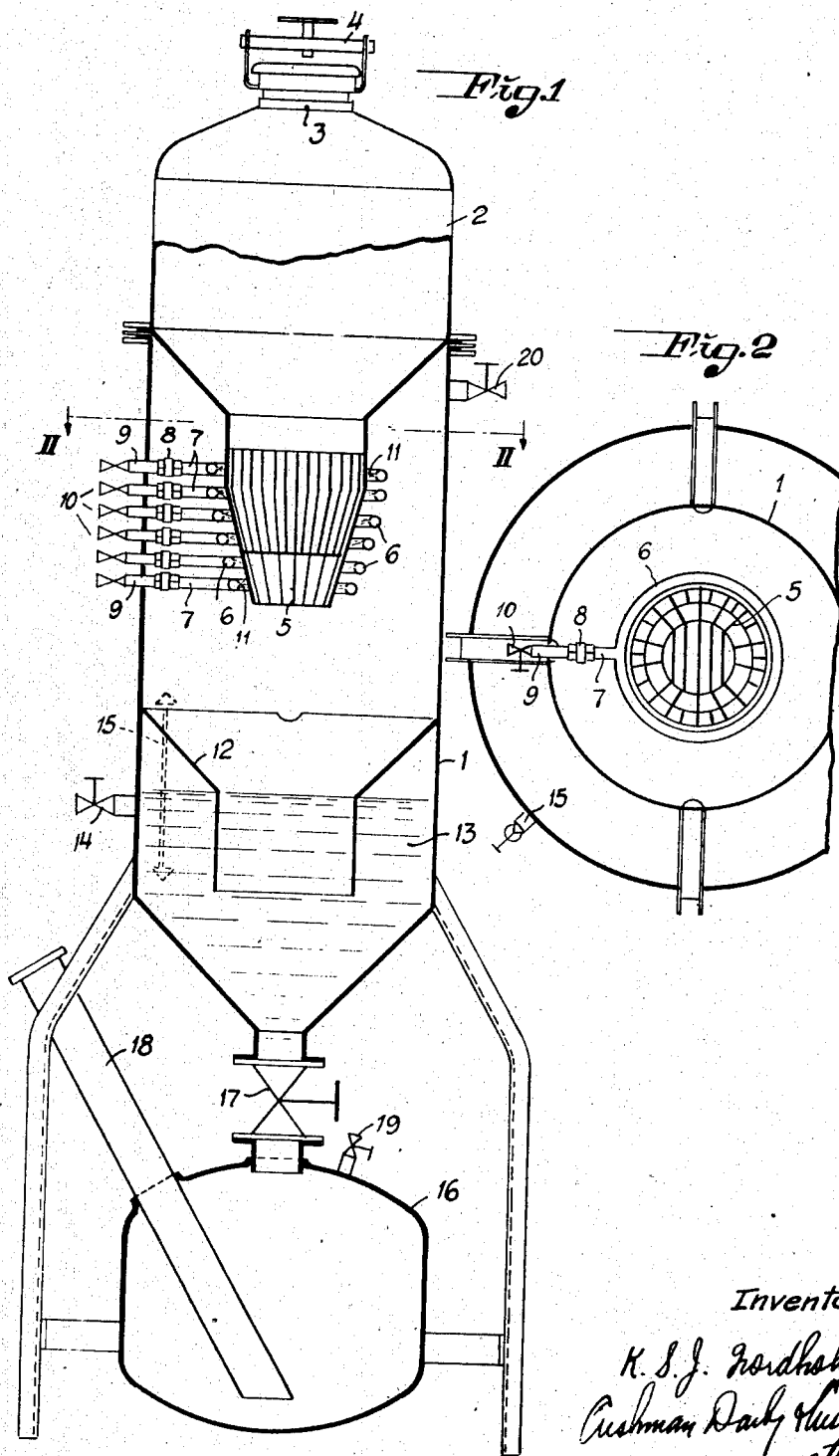
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ACETYLENE GENERATOR

Filed Dec. 4, 1943

2 Sheets-Sheet 1



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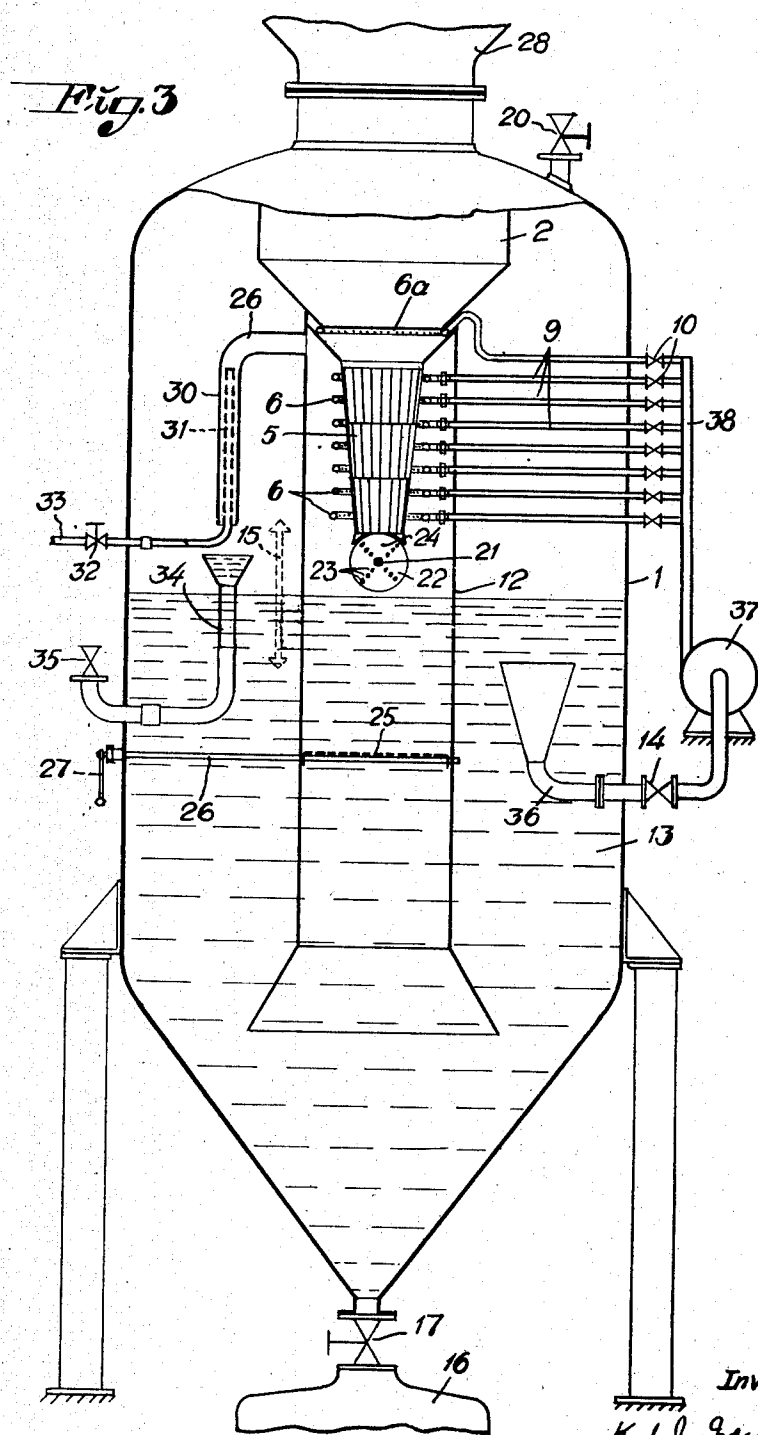
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UNITED STATES PATENT OFFICE

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ACETYLENE GENERATOR

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4 Claims. (Cl. 48—4)

This invention relates to an acetylene generator including a latticed or perforated receptacle or the like hanging down in a gas-tight covering, said receptacle being charged or fed with carbide and outwardly sprinkled with water.

One object of the invention is to provide an acetylene generator of the type indicated in which widely varying amounts of acetylene can be produced per unit of time.

Another object is to ensure a very intensive gasification of the carbide in using a relatively simple and easily controllable structure.

A further object is to construct an acetylene generator which is operating according to the combination of the principals "water to carbide" and "carbide to water".

These and further objects of the invention will now be described with reference to the accompanying drawings, in which:

Fig. 1 shows partly in vertical section an acetylene generator according to the invention.

Fig. 2 is section on line II—II in Fig. 1.

Fig. 3 shows in similar manner as Fig. 1 another embodiment of the invention.

The acetylene generator comprises a container 1 the upper part 2 of which is releasably joined to the container 1 and serves as a replenishing chamber for the carbide. The chamber 2 has a charge opening 3 provided with a pressure tight cover 4. The lower portion of the chamber 2 is provided with a perforated receptacle 5 hanging in the centre of the container 1.

Around the receptacle 5 there are arranged means for sprinkling water on the carbide in the receptacle. In the embodiment shown in Fig. 1, these means consist of six annular tubes 6 surrounding the receptacle and connected with separate feeding conduits 9 by means of tubes 7 and joints 8, said feeding conduits having individual shut off or valve means 10. In the walls of the tubes 6, there are openings 11 through which water is sprinkled against the carbide in the receptacle. Preferably, the openings in the upper annular tube or tubes 6 are directed somewhat downwards and, if desired, the openings in the undermost tube or tubes may be directed somewhat upwards, as will be understood from the direction of the water jets indicated in Fig. 1. In the embodiment shown, the two uppermost tube rings 6 have the greatest diameters, and the diameters of the other rings decrease successively from the top downwards. Due to this arrangement, the strongest jets are delivered from the upper tube rings 6 to the largest carbide pieces. For the same purpose the openings

in the upper tube rings may be wider than those in the undermost rings.

Instead of the separate tube systems, there may be provided a tube coil round the receptacle to which tube coil water is admitted from a single feeding conduit having shut off means. Due to the arrangement of separate tube systems, the control of the water sprinkling is readily obtainable by totally closing one or more of the tube systems without interfering with the other systems. It has been found particularly advantageous to join the tube systems with a pressure conduit conveying water of a relatively high pressure, for instance 3–6 kg./cm.² or more, so that the carbide pieces are exposed to forcible water jets flushing off the calcareous slime formed on the carbide pieces at the gasification. Thus, the carbide pieces continually present a rinsed carbide surface thereby permitting a very active gasification even with large carbide pieces measuring, for instance, up to 80 mm. in length. The forcible water jets are also conveying the carbide pieces down from the receptacle when they have been consumed to such an extent that they can pass between the bars of the receptacle. The upper carbide layers are thereby continually fed down in the receptacle and no special feeding means are necessary. A suitable width of the space between the bars is 15–20 mm. Owing to the separate tube systems, the gasification may be controlled by completely closing one or more of the nozzle systems, preferably beginning at the top, the force of the water jets from the other systems being not decreased, whereas, with a tube coil having but one feeding conduit, the control has to be effected by choking more or less the water supply, whereby the force of the water jets decreases correspondingly.

For controlling the shut off means 10 in relation to the pressure of the generated gas, said means may be arranged to be actuated by any suitable automatically operated members.

When the dimensions of the carbide pieces have been reduced so that the carbide pieces can pass between the bars of the receptacle 5 the pieces are conveyed out from the receptacle and down through a funnelshaped guide member 12 to the lower end of the container 1 where there is always present a water bath 13 up to an approximately constant level. The guide member 12 may, if desired, be arranged to extend upwards round the receptacle 5 and the sprinkling means. In the water bath 13, the gasification of the carbide is continued and finished. For maintaining an approximately constant level of

the water bath 13 there is provided an outlet valve 14 from which the water preferably is brought back to the feeding conduits 9 by means of a pump (not shown), advantageously over a clarification apparatus, so that the same water is circulating through the system. A water-gauge tube 15 indicates the water level in the container 1.

Below the container 1, there is provided a slime separator 16 to which the calcareous slime collected in the container 1 is admitted through a valve 17. The slime is blown out from the slime separator through a tube 18 by means of air or water under pressure introduced through the valve 19. If pressure-water is used, the water quantity consumed at the gasification is automatically replaced by a corresponding water quantity rising up into the container 1 when the slime is sinking down in the separator 16.

The acetylene is extracted from the container 1 through a valve indicated by 20. The embodiment shown is especially suitable for large acetylene generators with a carbide charge of more than 500 kgs.

In the embodiment shown in Fig. 3, similar numerals have been used as in Fig. 1 for indicating similar parts. Here, the guide member 12 extends upwards so as to encircle the perforated receptacle 5 and the nozzle tubes 6 for the water. In this case, the perforated receptacle is higher and narrower than in the embodiment according to Fig. 1, and the bottom diameter is less than a third of the height of the receptacle. The upper nozzle ring 6a is located above the receptacle in the funnel-shaped joint between the carbide chamber 2 and the receptacle 5. This arrangement permits besprinkling of such carbide pieces which from some cause get caught and thus form an arch or bridge blocking the passage for the carbide down into the receptacle. The carbide chamber 2 is connected to an upper magazine 28 from which the carbide is in a suitable manner locked down into the chamber 2.

Underneath the perforated receptacle 5, there is provided a wheel fastened to a shaft 21, said wheel being formed by two discs 22 between which there is arranged a number of ribs or bars 23 in such a manner that there are formed pockets 24 constituting the bottom of the perforated receptacle. Impurities mixed with the carbide, especially heavier impurities, which are insoluble in water are collected in the pocket 24. From time to time the shaft 21 is turned so that the pocket 24 previously located directly below the receptacle is turned down in order to permit the impurities to fall down in the water bath 13.

In the guide member 12 and below the perforated receptacle 5, there is a perforated plate 25 supported by a shaft 26 which can be turned by means of a handle 27. When the carbide pieces treated have been consumed to such an extent that they can pass between the bars of the perforated receptacle 5, they will fall down on the perforated plate 25. Water is continually flowing down through the plate 25, and the carbide pieces lying on it are then rapidly and effectively gasified. If the carbide pieces should fall directly down into the slime at the bottom of the container 1 their gasification would be obstructed and delayed, and the temperature in the lower part of the container would become very high. When there is a layer of extraneous impurities on the plate 25, the plate is turned by means of the lever 27 so that the impurities will fall down on the bottom of the container 1.

The acetylene generated during the water sprinkling leaves the guide member 12 through a tube 26 at the top of the guide member, said tube having a vertical downwardly directed portion 30. In the vertical portion 30, there is inserted a perforated tube 31 which is connected to a water conduit 33 provided with a shut off valve 32. The gas passing through the tube 26, 30 is thus forced through an effective water shower emitted from the perforated tube 31 and is thus purified. Right under the opening of the tube 30, there is located the funnel-shaped end of a tube 34 leading from the gas chamber of the container 1 to a safety valve 35. From the tube 30, water is continually running down into the tube 34 so that there is normally formed a sort of water seal which prevents gas-leakage through the safety-valve.

From the water bath 13, the water is conducted through the tube 36 and the outlet valve 14 over a pump 37 and a pressure conduit 38 to the feeding conduits 9 for the nozzle tubes 6.

In both forms of the invention, it will be observed that the height of the carbide receptacle 5 exceeds considerably the width of the bottom thereof.

What I claim is:

1. An acetylene generator comprising in combination, a perforated carbide receptacle, a water conduit, a plurality of annular tubes connected to said conduit and arranged one above the other round said receptacle, said annular tubes having nozzle openings for sprinkling water against said perforated receptacle, a gas-tight covering at least round said receptacle and said annular nozzle tubes, a water outlet from said covering, a gas outlet from said covering, the height of said carbide receptacle exceeding considerably the width of the bottom thereof, and a plurality of independently operable valve means for controlling the flow of the water through said nozzles.

2. An acetylene generator comprising in combination, a perforated carbide receptacle tapering downwards, a water conduit, a plurality of nozzles connected to said conduit and arranged one above the other for sprinkling water against said perforated receptacle at different levels thereof, a gas-tight covering round said receptacle and said nozzles, a water chamber below said receptacle in the lower portion of said covering for receiving carbide pieces falling down from said perforated receptacle, a vertical guide member in said covering for guiding said carbide pieces down to said water chamber, a swingable perforated plate located below said receptacle in said guide member and arranged to prevent carbide pieces from sinking down to the bottom of said water chamber, means for swinging said plate from the outside of the said covering, a water outlet from said covering, a gas outlet from said covering, the height of said carbide receptacle exceeding considerably the width of the bottom thereof, and a plurality of independently operable valve means for controlling the flow of the water through said nozzles.

3. An acetylene generator comprising in combination, a perforated carbide receptacle, a pocketed wheel constituting the bottom of said receptacle, a water conduit, a plurality of nozzles connected to said conduit and arranged one above the other for sprinkling water against said perforated receptacle at different levels thereof, a gas-tight covering round said receptacle and said nozzle, means for turning said pocketed wheel from the outside of said covering, a water outlet

from said covering, a gas outlet from said covering, the height of said carbide receptacle exceeding considerably the width of the bottom thereof, and a plurality of independently operable valve means for controlling the flow of the water through said nozzles.

4. An acetylene generator comprising in combination, a perforated carbide receptacle, a water conduit, a plurality of annular tubes connected to said conduit and arranged one above the other round said receptacle, said annular tubes having

nozzle openings for sprinkling water against said perforated receptacle, a gas-tight covering at least round said receptacle and said annular nozzle tubes, a water outlet from said covering, a gas outlet from said covering, the height of said carbide receptacle exceeding considerably the width of the bottom thereof, and a plurality of valve means for controlling the flow of the water through said nozzles.

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