

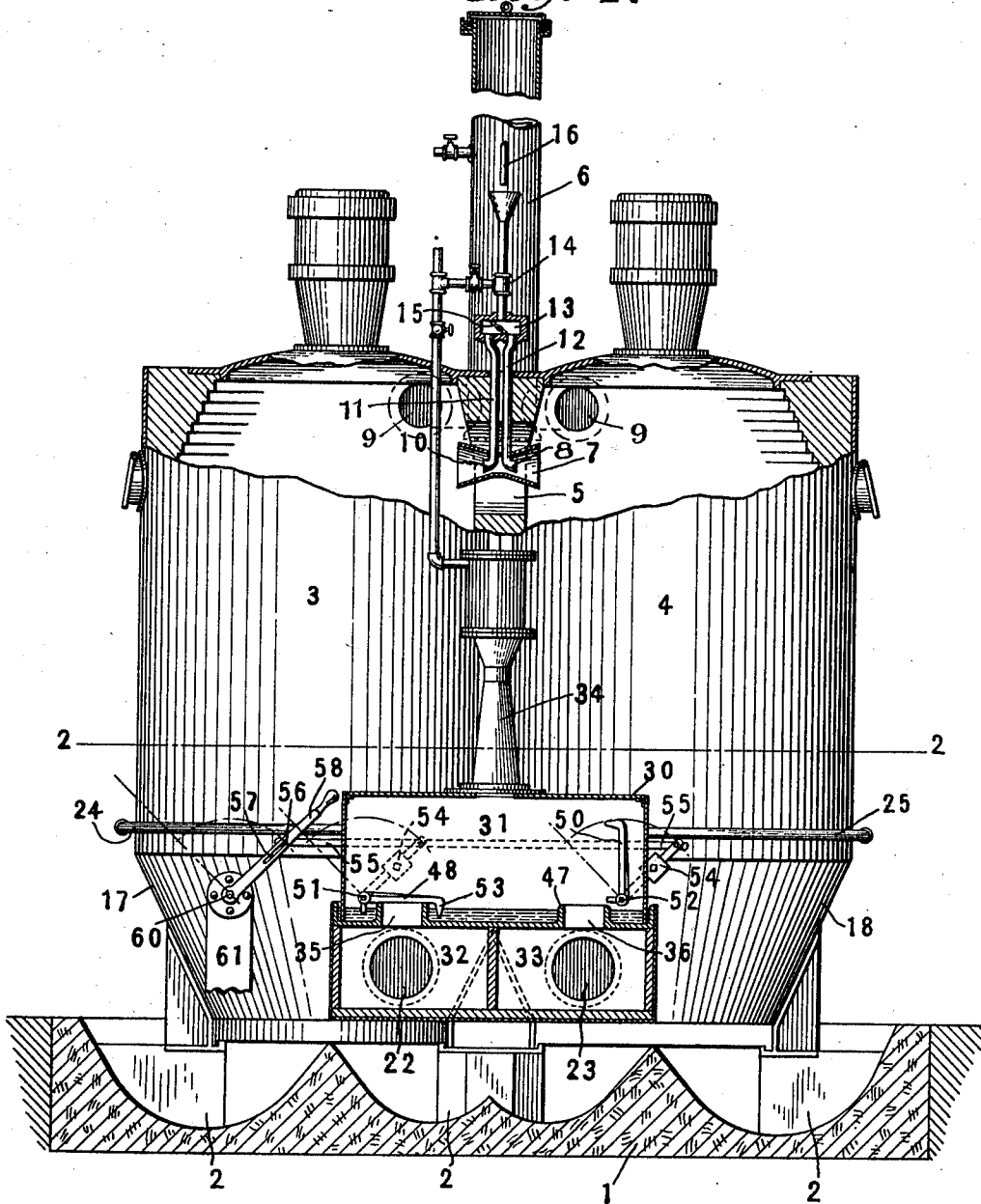
J. A. HERRICK.
GAS PRODUCER APPARATUS.
APPLICATION FILED JULY 15, 1909.

1,004,024.

Patented Sept. 26, 1911.

4 SHEETS—SHEET 1.

Fig. 1.



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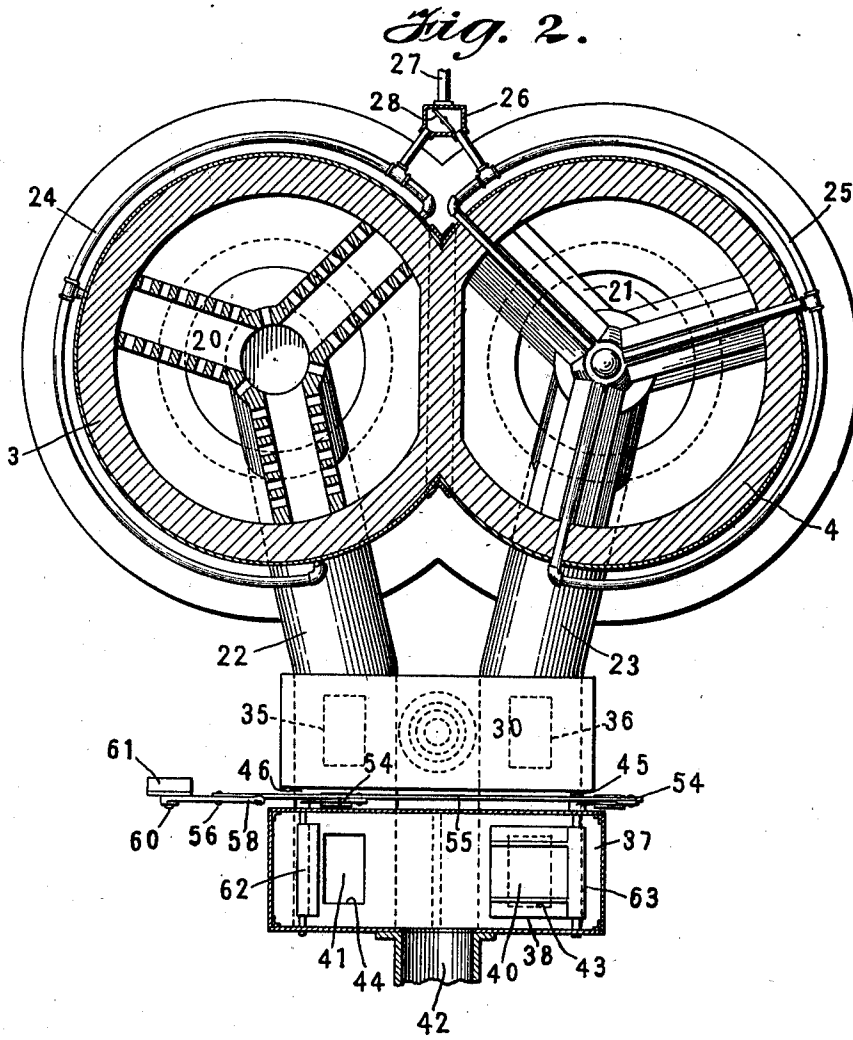
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Patented Sept. 26, 1911.

4 SHEETS—SHEET 2.



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4 SHEETS-SHEET 3.

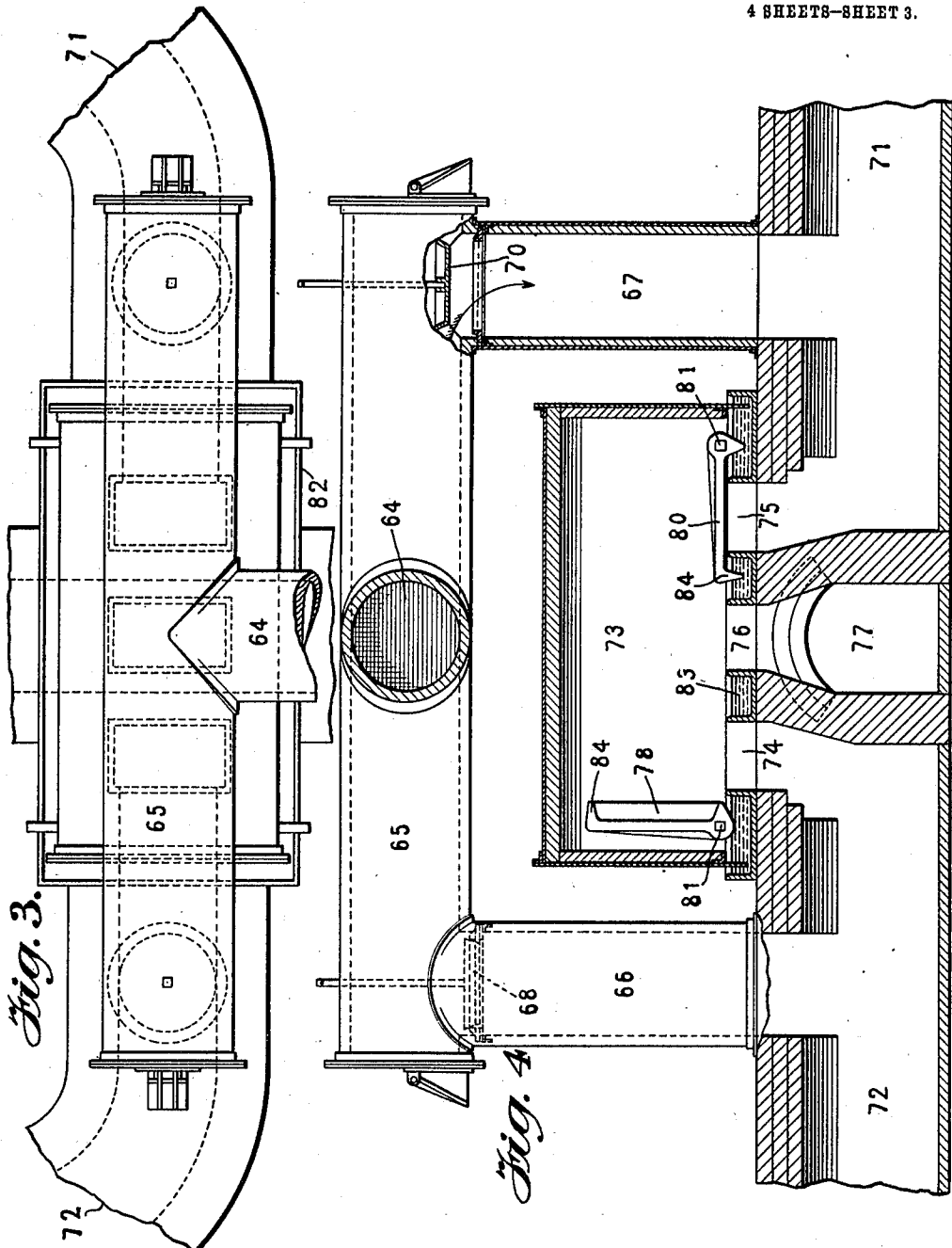


Fig. 3.

Fig. 4.

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4 SHEETS—SHEET 4.

Fig. 7.

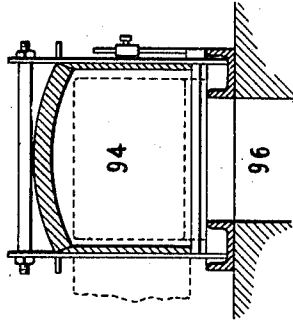


Fig. 5.

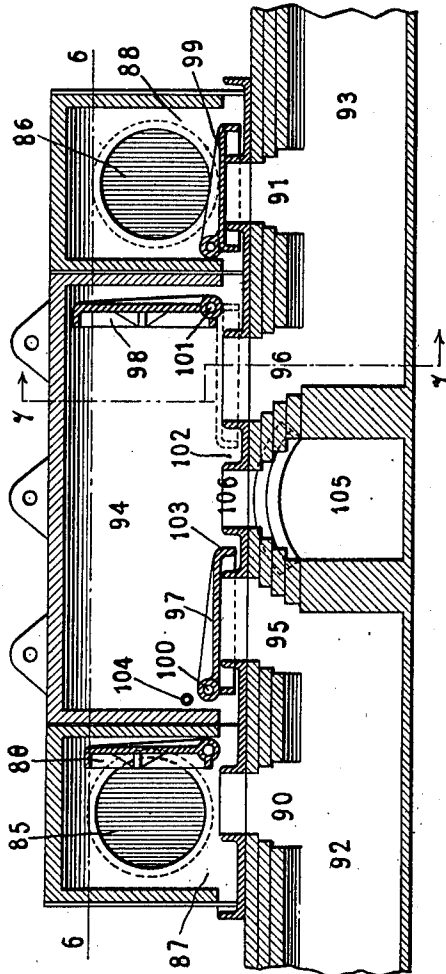
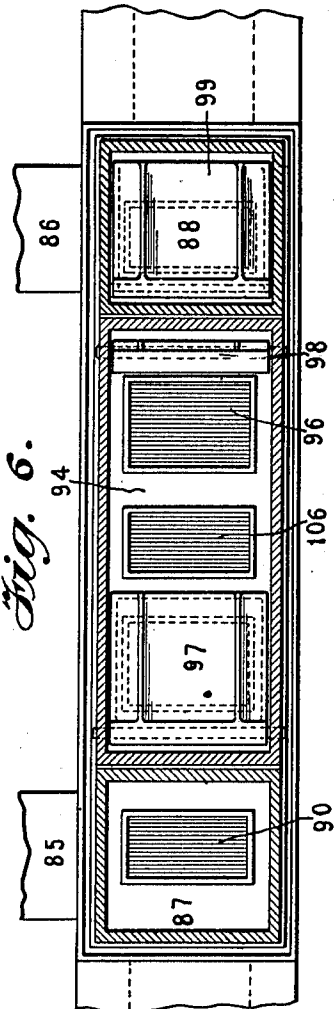


Fig. 6.



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UNITED STATES PATENT OFFICE

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GAS-PRODUCER APPARATUS.

1,004,024.

Specification of Letters Patent. Patented Sept. 26, 1911.

Application filed July 15, 1909. Serial No. 507,725.

To all whom it may concern:

Be it known that I, JAMES A. HERRICK, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Gas-Producer Apparatus, of which the following is a specification.

This invention relates to the manufacture of gas, and one of the objects thereof is to provide new and improved means whereby blast may be discharged into and gas conducted from either of a pair of duplex producers.

Another object of the invention is to provide new and improved valve mechanism adapted for use with gas producing and gas consuming apparatus.

Another object is to provide improved means whereby the valve mechanism may be kept cool and thereby prevented from becoming burned out.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts, which will be exemplified in the construction hereinafter described, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is illustrated several of preferred forms of embodiment of my invention: Figure 1 is a view partly in elevation and partly in vertical section, showing one embodiment thereof; Fig. 2 is a horizontal sectional view; taken substantially on the line 2—2 of Fig. 1; Fig. 3 is a plan view of one embodiment of my improved valve apparatus; Fig. 4 is a vertical sectional view of the apparatus illustrated in Fig. 3; Fig. 5 is a view in vertical section of another embodiment of the valve apparatus. Fig. 6 is a horizontal sectional view of the apparatus illustrated in Fig. 5; and Fig. 7 is a view in vertical section taken substantially on the line 7—7 of Fig. 5.

Similar reference characters refer to similar parts throughout the several figures of the drawings.

Referring now to the drawings and particularly to the embodiment of my invention shown in Figs. 1 and 2, 1 denotes a base or setting of a producer structure and is provided with a plurality of receptacles or basins 2, constructed to contain water which

seals the lower end of the apparatus. These receptacles are also constructed for receiving the ash discharged from the producers from which they may be removed by any suitable means. 3 and 4 respectively indicate a pair of duplex producers connected at their upper ends as by means of the passage way 5 and having a common purge pipe 6 which is connected with each producer as by means of the branch pipes indicated at 9. Located in passage way 5, preferably in the central portion thereof is an open ended box 7. Nozzles 8 and 10 are adapted to discharge steam through said box into either of said producers, said nozzles being connected by pipes 11 and 12 with the valve chamber 13 into which leads steam pipe 14. A valve 15 is located in chamber 13 and is adapted to connect either of said pipes 11 or 12 with a source of steam supply. If desired oil or other gas enriching substance may be introduced into the chamber 13 as by means of the pipe 16. The lower ends of each of the producers 3 and 4 taper inwardly as shown at 17 and 18 respectively, and their lower ends are disposed beneath the surface of the water in the receptacles 2. Located within the lower ends of the producers are twyer box structures 20 and 21 and connected with the central portions of said twyer boxes are conduits 22 and 23, respectively. Water may be sprayed upon each of said twyer boxes as by means of pipes 24 and 25 which receive their supply of water from a valve chamber 26 which in turn is supplied by pipe 27; a valve 28 being located in the valve chamber and adapted to connect either of pipes 24 or 25 with a source of water supply to the exclusion of the other pipe. 30 denotes a box which in the present instance is divided into three compartments or chambers 31, 32 and 33 respectively. A blast pipe 34 leads into chamber 31 and this chamber is connected with chambers 32 and 33 as by means of the passage ways 35 and 36, respectively. Conduit 22 communicates with chamber 32 and conduit 23 with chamber 33 as shown. Located adjacent box 30 is a second box 37, which is similarly divided into three compartments 38, 40, and 41 and leading from compartment 38 is a gas exit conduit 42. Passage ways 43 and 44 connect compartment 38 with compartments 40 and 41 and said latter compartments are connected as by means of con-

duits 45 and 46 with compartments 33 and 32 respectively. The passage ways 35 and 36 which lead from chamber 31 to chambers 32 and 33 are formed by up-standing portions or flanges 47 and these up-standing portions or flanges and the lateral walls of chamber 31 form receptacles for water which serve to keep the various parts in a cool condition. 48 and 50 indicate valves which are carried upon shafts 51 and 52 supported in suitable journals provided in the side wall of chamber 31. Each of these valves is provided with a laterally extending flange 53 which when the valve is closed as shown in Fig. 1 extends downward into the water whereby both of passage ways 35 and 36 may be water sealed when their valves are closed. Each of shafts 51 and 52 is provided with a weighted arm 54 and said arms are connected as by means of a rod 55 carrying a stud 56 which is received in a slot 57 of an operating handle 58. This operating handle is mounted at 60 upon a support 61. By means of the construction just described, it will be seen that valves 48 and 50 are connected to operate in unison the construction being such that when one valve is open the other valve will be closed. Box 37 is provided with a valve construction similar to that above described; the valves being shown at 62 and 63, the shafts of said valves having arms similar to arms 54 which are similarly connected with rod 55. Having thus described the construction of this embodiment of my invention, the manner in which the same is operated may now be understood. In the drawings valve 50 of chamber 31 is shown open and valve 48 closed. Valve 62 of chamber 38 is open and valve 63 closed. When the parts are in these positions, the direction of flow of the blast from the blast pipe 34 will be as follows: from blast pipe 34 through valve chamber 31, passage way 36 and conduit 23 into producer 4, thence upward through producer 4, through passage way 10, downward through producer 3 into the twyer box structure 20, the gas will then pass through conduit 22 into chamber 32, then through conduit 46 into compartment 41 upward through passage way 44, into valve chamber 38 whence it is discharged through conduit 42. When the positions of the several valves are reversed passage of the blast and gas through the apparatus is in an opposite direction; the gas always being delivered through the discharge conduit 42 and it will be seen that by means of the construction the various gases must always pass in predetermined directions.

Referring to the embodiment of my invention illustrated in Figs. 3 and 4, 64 indicates a pipe adapted for delivering gas from any suitable source of supply into a conduit 65, and leading from conduit 65

are conduits 66 and 67 each of which is provided with a valve as shown at 68 and 70. Conduit 67 leads into a conduit 71 which in turn may conduct the gas to a furnace or other gas utilizing apparatus. Similarly, conduit 66 leads into a conduit 72 which may be connected with said gas utilizing apparatus. 73 indicates a valve chamber having passage ways 74 and 75 which communicate with conduits 72 and 71 respectively, and a passage way 76 leads from valve chamber 73 to a stack 77. Valves 78 and 80 are adapted to open and close passage ways 74 and 75, said valves being carried upon rotatable shafts as at 81 and adapted to be operated alternately in unison by means of rods 82 which connect said shafts. The bottom wall of valve chamber 73 is provided with channels as at 83 which are adapted to contain water which keeps the parts cool. The lateral flanges 84 of the valves 78 and 80 extend into this water whereby when each valve is closed the passage way covered thereby is water sealed. When the parts are in the positions shown the gas passes from conduit 64 into conduit 65, then through conduit 67 to conduit 71, whence it passes through to a furnace or other gas utilizing apparatus. The products of combustion return from the gas utilizing apparatus through conduit 72 whence they pass through passage way 74 into valve chamber 73 and discharge through passage way 76 into the stack 77.

Referring now to the embodiment of my invention shown in Figs. 5 to 7 inclusive, 85 and 86 respectively indicate conduits which may extend from a gas producer or any other source of gas supply. These conduits lead into compartments 87 and 88 provided, respectively, with passage ways 90 and 91 which lead into conduits 92 and 93, each of which is connected with gas utilizing apparatus, such as a furnace. Passage ways 90 and 91 may be closed as by means of valves 89 and 99 mounted to be swung upon shafts as shown. 94 denotes a valve chamber which is connected with conduits 92 and 93 as by means of passage ways 95 and 96, said passage ways being adapted to be closed as by means of swinging valves 97 and 98 mounted upon shafts 100 and 101. These valves may be connected to move in unison and in alternation so that when one passage way is closed the other is open. Valves 89 and 99 may be similarly connected. Valves 89 and 99, 97 and 98 may be connected to a single operating rod actuated by a single lever. The bottom of chamber 94 is provided with channels 102 adapted for containing water which keeps the various parts cool and into which dips the flanges 103 of the valves. The valves may be cooled if desired as by means of pipes 104 which may be provided with a plurality of small aper-

tures through which water may be distributed upon said valves. Valve chamber 94 connects with the stack 105 by means of the passage way 106. With the parts in the position shown in the full lines of the drawings, gas is discharged through conduit 85 into compartment 87 thence through passage way 90 to conduit 92 which conduit leads the gas to the furnace or other gas utilizing apparatus and the products of combustion return to conduit 93 and enter valve chamber 94 through conduit 96 and are then discharged into the stack through the passage way 105. When the valves 89 and 99, 97 and 98 occupy their opposite positions the direction of flow of gas and of the products of combustion is in the opposite direction through the apparatus; the products of combustion entering the valve chamber 94 through the passage 95 to be discharged into the stack through the passage way 106.

Accordingly it will be seen that I have provided an apparatus particularly well adapted to attain, among others, all the ends and objects above enumerated in a simple yet efficient manner; and as many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention, which as a matter of language, might be said to fall therebetween.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In apparatus of the class described, in combination, a pair of producers, a passage way connecting said producers at their upper ends, a valve box located adjacent the lower end of said producers, a twyer box in each of said producers, conduits connecting said valve boxes with said twyer box, a blast pipe leading into said valve box, a valve adapted when open to permit the blast to flow through one of said conduits, and a second valve in said valve box which prevents the blast from flowing through the other of said conduits.

2. In apparatus of the class described, in combination, a pair of producers, a passage way connecting said producers near their upper ends, a twyer box in the lower portion of each of said producers, a valve box divided into a plurality of compartments, a conduit leading from one of said compart-

ments to the twyer box of one of said producers, a conduit leading to the twyer box of the other of said producers from another compartment of said producer, a blast pipe leading into a third compartment of said valve box, passage ways connecting the said last named compartment with said first named compartments, and a pair of valves in said third mentioned compartment each of which is adapted to close one of said passage ways.

3. In an apparatus of the class described, in combination, a pair of producers, a conduit between said producers, a pair of chambers to which said producers are respectively connected, a valve chamber having valve controlled connection with said first named chambers, a blast pipe connected to said valve chamber, a second pair of chambers connected respectively to said first named chambers, a valve chamber having valve controlled connection with each of said last named pair of chambers, and a gas exit conduit leading from said last named valve chamber.

4. In an apparatus of the class described, in combination, a pair of producers, a conduit between said producers, a pair of chambers to which said producers are respectively connected, a valve chamber, passage ways connecting said first named pair of chambers with said valve chamber, valves for opening and closing said passage ways, a blast pipe connected with said valve chamber, a second pair of chambers connected respectively to said first named chambers, passage ways connecting said second named valve chamber with said last named pair of chambers, valves for opening and closing said passage ways, and a gas exit leading from said last named valve chamber.

5. In apparatus of the class described, in combination, a pair of producers, a conduit between said producers, a pair of chambers to which the producers are respectively connected, a valve chamber, passage ways connecting said valve chamber with said first named pair of chambers, a valve for each of said passage ways, means for connecting said valves whereby said passage ways may be opened and closed in alternation, and a gas exit conduit leading from said second named valve chamber.

6. In apparatus of the kind described, in combination, a pair of producers, a conduit between said producers, a pair of chambers to which said producers are respectively connected, a valve chamber, passage ways connecting the said first named pair of chambers with said valve chamber, a valve for each of said passage ways, a water seal for said valves, means for connecting said valves whereby they may be operated in unison, a blast pipe leading into said valve chamber, a second pair of chambers connected respec-

tively to said first named pair, a second valve chamber, passage ways connecting said second named pair of chambers with said second named valve chamber, valves
 5 for said passage ways, means for connecting said valves whereby they are caused to operate in unison, a water seal for said valves, and a gas exit conduit leading from said second named valve chamber.

10 7. In apparatus of the class described, in combination, a pair of producers, a conduit between said producers, a pair of chambers to which the producers are respectively connected, a valve chamber, passage ways connecting said passage ways with said valve chamber, a valve for each of said passage
 15 ways, each valve being provided with a laterally extending flange, said valve chamber being adapted to contain water into which
 20 said flange extends when the valve is closed whereby said passage ways when closed are water sealed, means for opening and closing said valves in alternation, a blast pipe leading into said valve chamber, and gas exit
 25 pipes leading from said first named chambers.

8. In apparatus of the class described, in combination, a pair of producers, a conduit connecting said producers, a pair of chambers to which said producers are respectively connected, a valve chamber, passage
 30 ways connecting said first named chambers with said valve chamber, a pivotally mounted valve having a laterally extending flange
 35 for each of said passage ways, each of said valves being adapted to be swung down over its passage way so that the flange thereof may extend into the water contained in said valve chamber, and means for operating said
 40 valves.

9. In apparatus of the kind described, in combination, a pair of producers connected at their upper ends, and means whereby blast may be discharged into one producer,

and gas discharged from the other, comprising a pair of boxes each of which is provided with a valve chamber, a blast pipe leading into the valve chamber of one box and a gas exit conduit leading from the valve chamber of the other box, a pair of compartments in each box adjacent the valve chamber thereof and connected therewith by
 50 valved passage ways, a conduit connecting the respective compartments of each box with the producer, and conduits connecting
 55 the respective compartments of said boxes.

10. In apparatus of the class described, in combination, a pair of producers, a twyer box in each of said producers, means for forcing a blast through one of said twyer
 60 boxes, and withdrawing gas through the other thereof, and means for discharging water upon said last mentioned twyer box.

11. In apparatus of the class described, in combination, a pair of producers, a twyer box in each producer, means for introducing a blast into one of said twyer boxes, means for withdrawing gas through the other of
 65 said twyer boxes, and means whereby water may be discharged upon the twyer boxes
 70 through which the gas is being withdrawn.

12. In apparatus of the class described, in combination, a pair of producers, a twyer box in each producer, means for forcing a blast into one of the twyer boxes, and for
 75 withdrawing gas through the other twyer box, means for discharging water upon both of said twyer boxes, and means whereby the twyer box through which the gas is being withdrawn may be connected with the source
 80 of water supply, while the water supply to the other twyer box is shut off.

In witness whereof I affix my signature in the presence of two witnesses.

JAMES A. HERRICK.

Witnesses:

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 B. W. COULDOCK.