48 GAS, HEATING & ILLUMINATING,
Generators,
Cupola Blast,
Up and Down run,

Draftsman.

No. 858,579.

PATENTED JULY 2, 1907.

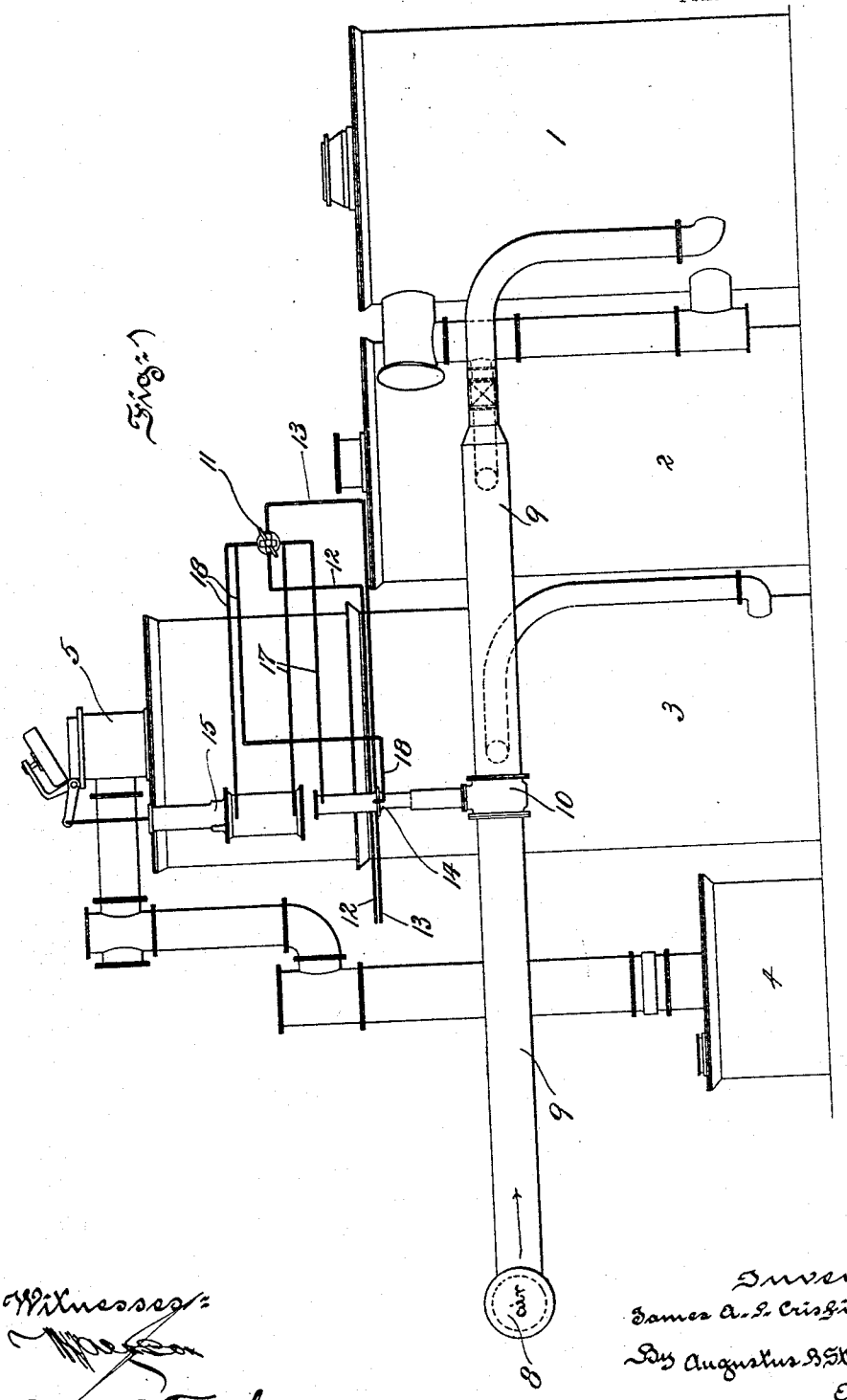
J. A. P. CRISFIELD.

WATER GAS APPARATUS.

APPLICATION FILED OCT. 15, 1904.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Frank E. French.

Inventor:
James A. P. Crisfield.
By Augustus B. Stoughton
Attorney

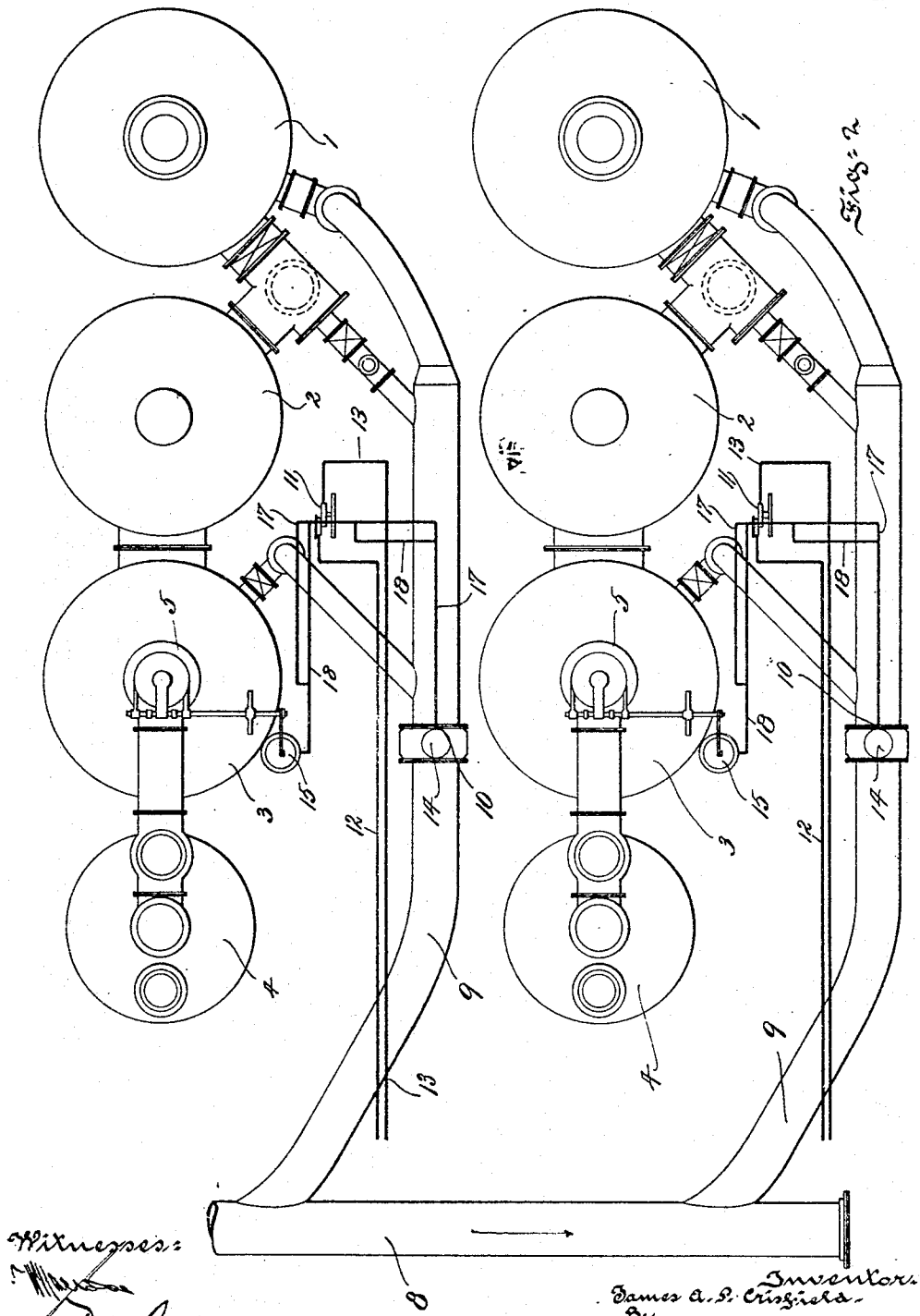
No. 858,579. PATENTED JULY 2, 1907.

J. A. P. CRISFIELD.

WATER GAS APPARATUS.

APPLICATION FILED OCT. 15, 1904.

4 SHEETS—SHEET 2.



Draftsman.

No. 858,579. PATENTED JULY 2, 1907.

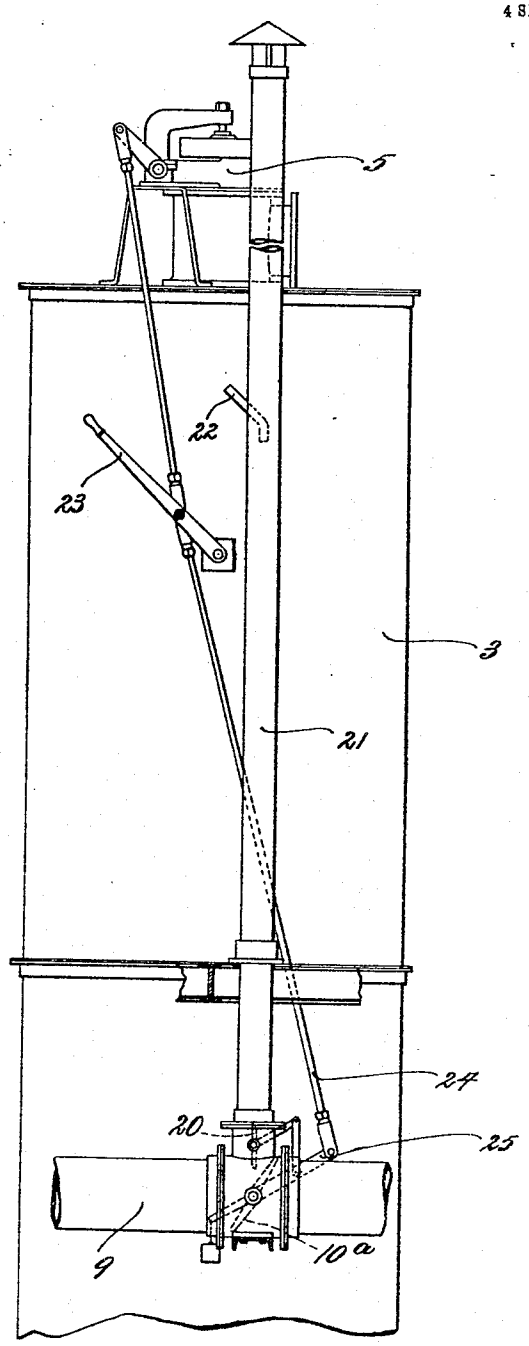
J. A. P. CRISFIELD.

WATER GAS APPARATUS.

APPLICATION FILED OCT. 15, 1904.

4 SHEETS—SHEET 3.

Fig. 3



Witnesses:

A. W. Kelligan

Inventor.
James A. P. Crisfield.
By Augustus B. Stoughton
Attorney.

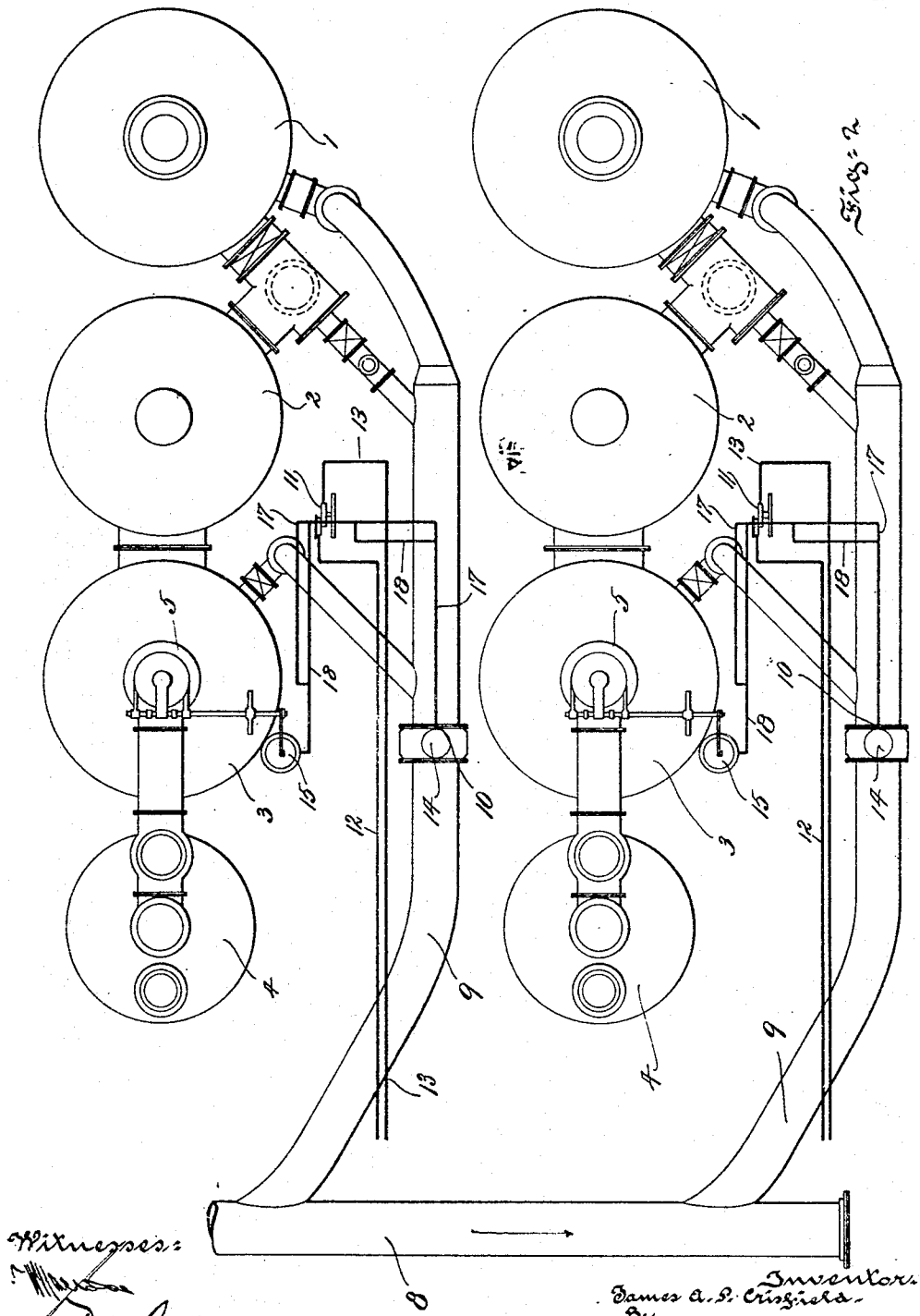
No. 858,579. PATENTED JULY 2, 1907.

J. A. P. CRISFIELD.

WATER GAS APPARATUS.

APPLICATION FILED OCT. 15, 1904.

4 SHEETS—SHEET 2.



Witnesses:
E. M. Gilligan

Inventor:
James A. P. Crisfield
By
Augustus B. Stoughton
Attorney

UNITED STATES PATENT OFFICE.

JAMES A. P. CRISFIELD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE UNITED GAS IMPROVEMENT COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

WATER-GAS APPARATUS.

No. 858,579. Specification of Letters Patent. Patented July 2, 1907.

Application filed October 15, 1904. Serial No. 228,634.

To all whom it may concern:

Be it known that I, JAMES A. P. CRISFIELD, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Water-Gas Apparatus, of which the following is a specification.

Objects of the present invention are to prevent firing back in the air pipes or conduit during the run, to isolate one set from all the others, so as to limit or confine explosive effects and generally to obviate explosions.

To these and other ends hereinafter set forth the invention stated in general terms comprises the interposition of a valve in the air supply on the pressure side of the branches to each machine, either alone or in combination with a stack valve, and means for automatically working said valves concurrently, and the invention further comprises the improvements to be presently described and finally claimed.

The nature, characteristic features and scope of the invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof and in which

Figure 1, is an elevational view of so much of a water gas set as is convenient for an explanation of the invention which is shown in application thereto, Fig. 2, is a top or plan view of Fig. 1, showing two sets of apparatus, Figs. 3 and 4 are respectively side and end views illustrating portions of a water gas set, provided with a modified embodiment of the invention.

In the drawings 1, is a generator, 2 a carbureter, 3 a superheater and 4 a wash box. These are connected together in the usual way and provided with their well understood accessories.

5, is a super-heater stack valve.

There is as usual a pipe, conduit or trunk for a supply of air, or in other words, for the blast. 8, is such a conduit to which the blast is admitted and from which air is led by a branch pipe 9, having appropriate subsidiary branches to the various parts of the apparatus.

In practice there are usually a plurality of sets of apparatus such as have been referred to and these sets each have a branch air pipe which communicates with a common air conduit or main, as illustrated in Fig. 2.

Having thus indicated certain well known features of construction, I will now proceed with a description of the parts embodying my invention, and will refer more particularly to Figs. 1 and 2.

10, is a valve, stop or closure interposed in the branch pipe 9, and similarly located valves are employed for each set of apparatus. When this valve 10 is closed it is obvious that it is impossible for any firing back to extend beyond it into the branch pipe and conduit from which it might be communicated to the other apparatus or sets of apparatus, and furthermore, by closing the valve 10 prior to the run, it is obvious that the blast does not reach the set, and the gas can not reach the conduit 8, so that firing back or explosive effects are prevented. Clearly the valve 10 could be operated by hand, but it is desirable to connect it in such a way that it will always be opened or closed as may be appropriate for the so-called blast or run in the gas making process. Otherwise stated, this air valve 10 and the stack valve 5 may be made interlocking or interdependent in their operation. I have shown in Figs. 1 and 2 one means for accomplishing this result and will now proceed with a description of the same.

11, is an appropriate valve shown as of the four-way type and it is connected with induction and eduction pipes 12 and 13 for motive fluid such as water for operating the stack valve, as well as the valve 10, which may be called the air cut-off valve. There is connected with the spindle of the valve 10 a cylinder and piston 14 and there is a piston and cylinder 15, connected with an arm projecting from the pivot pin or trunnion of the stack valve. One side of the four-way valve or cock 11 is connected by the pipes 18 with the upper end of the cylinder 15, and with the lower end of the cylinder 14. The other side of the cock is connected by the pipes 17, with the lower end of the cylinder 15, and with the upper end of the cylinder 14, so that when the cock is turned in one direction the valve 10, and the stack valve are both opened and when turned in the other direction are both closed, thus insuring the closing of the valve 10 at the proper time for avoiding fire backs and explosions.

In Figs. 3 and 4, there is shown in the branch pipe 9, a ventilated valve, which in effect comprises two valves 10^a and 20, so arranged that when the valve 10^a shuts off the supply of air to the apparatus the valve 20 establishes communication between that portion of the pipe 9, between the appartaus and the valve 10^a, and the atmosphere, for example, by way of the vent pipe 21, which may be provided with a tell-tale 22; so that if gas should enter the portion of the pipe 9, between the apparatus and the valve 10^a, this portion of pipe is ventilated and the gas that might otherwise accumulate in it is withdrawn and may not reach the air on the pressure side of the valve 10^a, when the latter is opened. In these figures I have also shown mechanical connections for inter-dependently operating the valves in the manner described. 23, is a hand lever, the shank of which is pivotally connected with a link 24. One end of this link is pivotally connected with an arm on the pivot pin or trunnion of the stack valve 5, and the other end is pivotally connected with an arm 25, projecting from the pivot pin or trunnion of the valve 10^a. An arm projecting from the pivot pin or trunnion of the valve 20,

is pivotally connected with one end of a link of which the other end is pivotally connected with the arm 25.

It will be obvious to those skilled in the art to which the invention relates, that modifications may be made in details without departing from the spirit thereof, hence the invention is not limited further than the prior state of the art may require, but

Having thus described the nature and objects of my invention, what I claim as new and desire to secure by Letters Patent is:

1. In combination water gas apparatus provided with an air trunk having a branch pipe provided with subsidiary branches leading to the various parts of the apparatus, a valve interposed in the branch pipe on the pressure side of the subsidiary branches, a ventilation valve between the last mentioned valve and the branches, a stack valve, and actuating means common to all said valves for working them in such a way as to open the ventilation valve when the other valves are closed and for closing the ventilation valve when the other valves are open, substantially as described.

2. In combination water gas apparatus provided with an air trunk having a branch pipe provided with subsidiary valved branches leading to the various parts of the apparatus, a valve interposed in the branch pipe on the pressure side of the subsidiary branches to establish a dead chamber on the apparatus side in which leakage from the valved subsidiary branches is confined, a stack valve, and actuating means common to the branch pipe valve and the stack valve for positively opening and closing them, substantially as described.

3. Water gas apparatus provided with an air trunk having a branch pipe leading to the various parts of the apparatus, and with a valve interposed in the branch pipe, and with a second valve and a ventilating pipe for ventilating the portion of the pipe between the first mentioned valve and the apparatus, substantially as described.

4. Water gas apparatus provided with an air trunk having a ventilation valve and a branch ventilating pipe interposed therein, substantially as described.

In testimony whereof, I have hereunto signed my name in the presence of witnesses.

JAMES A. P. CRISFIELD.

Witnesses:

F. B. RANKIN,

THOS. A. JAMES.