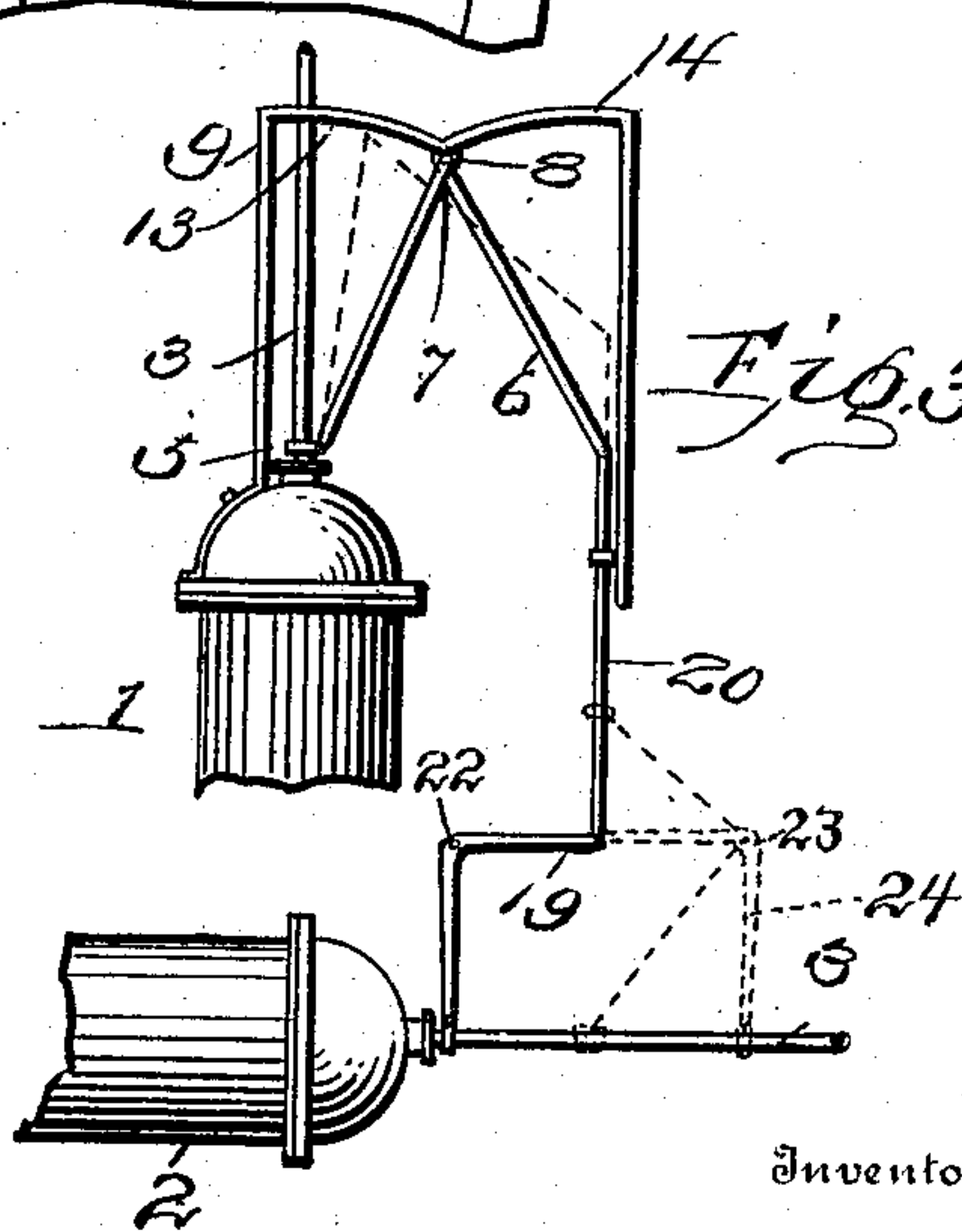
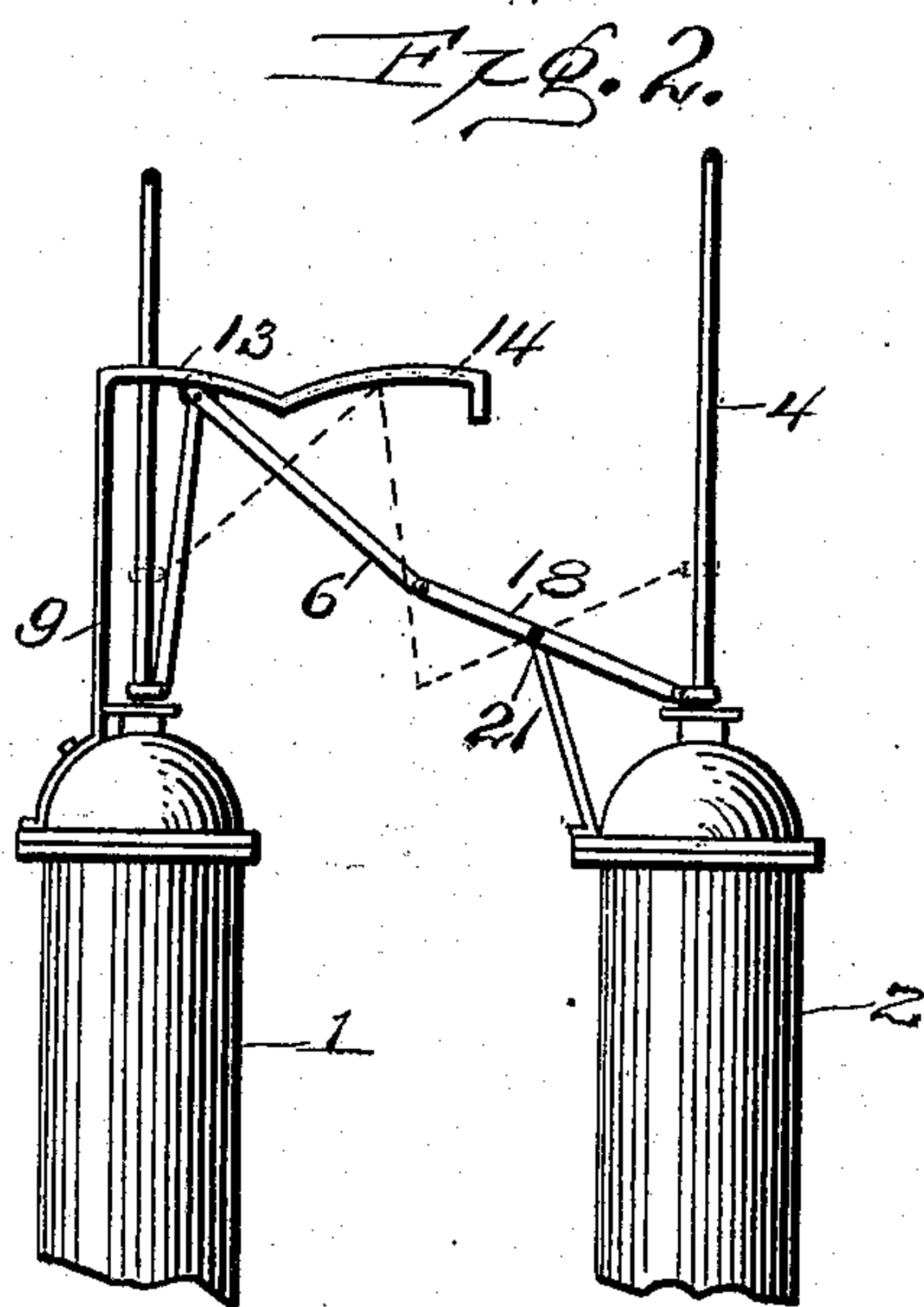
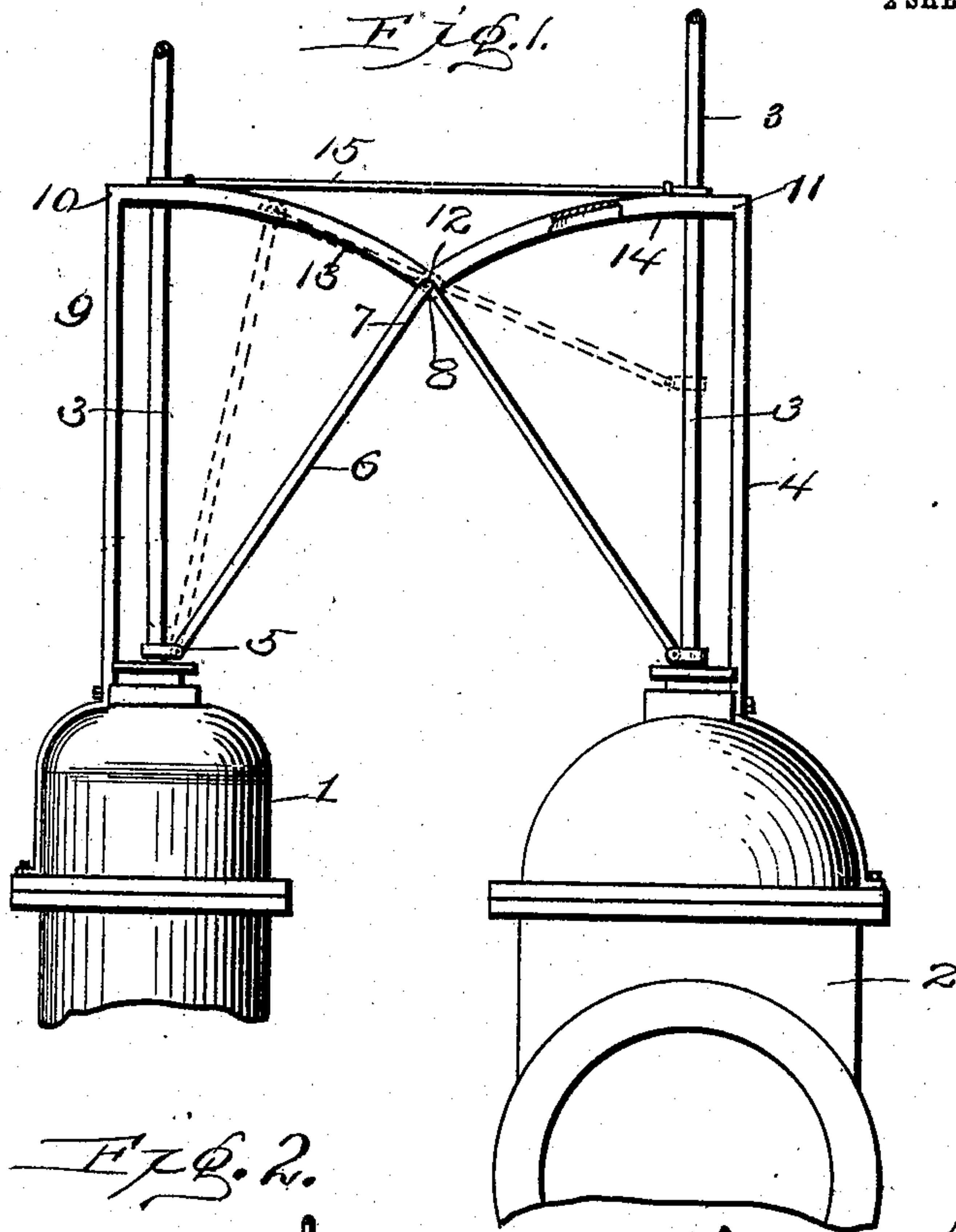


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 VALVE CONTROLLING MECHANISM.  
 APPLICATION FILED JUNE 6, 1908.

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2 SHEETS—SHEET 1.



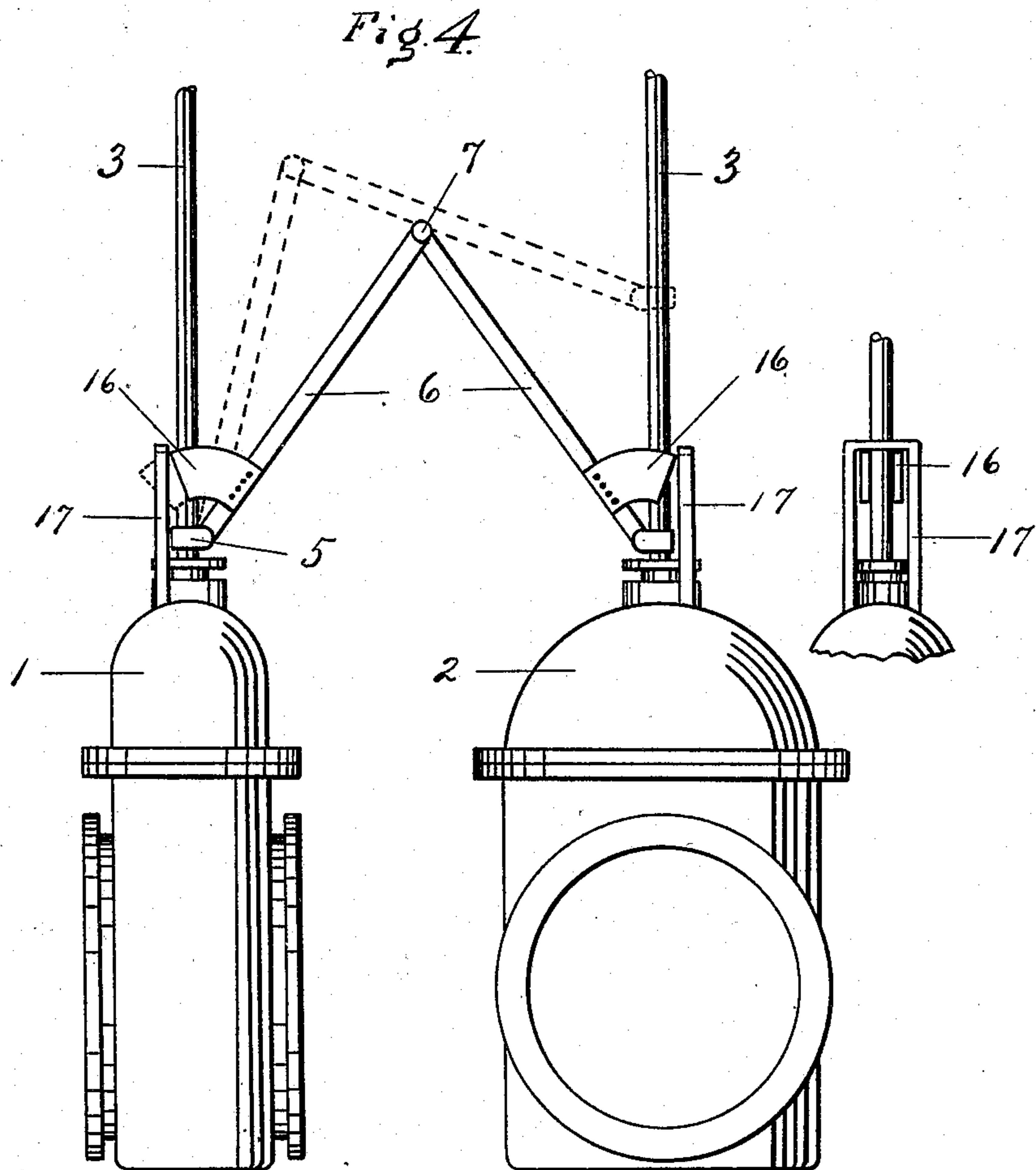
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# UNITED STATES PATENT OFFICE.

PHILIP LIGHTFOOT WORMELEY, JR., OF WASHINGTON, DISTRICT OF COLUMBIA.

## VALVE-CONTROLLING MECHANISM.

No. 919,992.

Specification of Letters Patent.

Patented April 27, 1909.

Application filed June 6, 1908. Serial No. 437,120.

*To all whom it may concern:*

Be it known that I, PHILIP LIGHTFOOT WORMELEY, Jr., a citizen of the United States, residing at Washington, District of Columbia, have invented certain new and useful Improvements in Valve-Controlling Mechanisms, of which the following is a specification.

This invention relates to valve controlling mechanisms and more particularly to interlocking devices whereby the opening of one valve locks and prevents the opening of another valve and vice versa.

The object of my invention is to provide an interlocking valve mechanism, so as to avoid the formation of an explosive material in a gas generating apparatus. The construction being such as to interlock the generator blast valve which controls the admission of air to the generator, with the bottom generator take-off valve (hereinafter referred to as bottom gas valve); through which the gas passes from the generator to the carbureting chambers. This interlocking of the valves referred to is accomplished by my valve controlling mechanism in such a way as to prevent the opening of either valve as long as the other valve is open or partially open, or in other words, to prevent the possibility of both valves being open at the same time.

Another object of my invention, is to provide an interlocking valve mechanism which with slight modifications of details, such as the use of rocker arms or bent levers, which ever may be found necessary, it is also possible to interlock the stack or take-off valve with the carbureter or superheater blast valve in such a way that the closing of the stack valve will lock and prevent the opening of either of the said blast valves, and the opening of either of the blast valves will lock and prevent the closing of the stack valve.

With these objects in view and such others as may hereinafter appear, my invention consists in the particular construction of the various parts, and in the novel manner of combination and arrangement of said parts, all of which will be more fully described and specifically pointed out in the appended claims.

In the drawings forming a part of this specification:—Figure 1, is a side elevation illustrating my invention as applied, Fig. 2, is a similar view illustrating a modified form, and Fig. 3, illustrates another modified form.

Fig. 4 is a side elevation illustrating a modified form.

Referring by numerals to the drawings, 1 represents one of the valves and 2 the other valve, each provided with a valve stem 3 and 4. Pivotally attached to the valve stems, 3 and 4, by collars, or other suitable means 5, are levers or arms 6, which are connected as shown at 7, at which point may be provided a small wheel or roller 8, all connections being such that the levers or arms, are free to move and adjust themselves to any position of one valve, provided the other valve is closed. Bolted or otherwise secured to the bonnets of the valves, 1 and 2, is a guide or abutment member 9, constructed of a section of channel iron or other suitable material, said guide having its legs parallel to the valve stems 3 and 4, and being bent at 10 and 11. The said valve stems may project through apertures therein. The center 12, of said guide being bent above the levers or arms to arcs of circles 13 and 14, in opposite directions of radii equal to the length of levers or arms, plus the necessary clearance. This guide is strengthened at its central portion by a tie rod 15.

It will be clearly seen by referring to Fig. 1, that if an attempt should be made to open both valves at the same time, the connected ends of the levers 6, would come in contact with the central portion 12, of the guide and make such movement impossible. Either one of the valves, say 2, may be raised, however and the levers will take the position as indicated in dotted lines, and in case an attempt is made to raise the other valve the connected ends of the levers will come in contact with the guide or abutment member and make such a movement impossible.

In lieu of the guide or abutment member above described, the levers 6, may be provided with circular projections or wings 16, secured upon the ends of the levers connected to the valve stems as clearly shown in Fig. 4. In such a construction, I provide stirrups or other stops 17 which are bolted or otherwise secured to the bonnets of the valves, said stirrups or stops being adapted to receive the circular projections or wings upon the arms 6, the construction being such that the tip of one wing will pass under the stirrup or stop, as soon as the other valve begins to open, thus locking the valve which is closed and vice versa. Any convenient obstruction may be placed just above the



jointed ends of the levers 6, to prevent the possibility of raising both valves at the same time. I do not consider this necessary however, since one man can operate but one valve at a time.

In Fig. 2, I have shown a modified form of my invention wherein any two valves such as 1 and 2 may be so connected by my improved interlocking valve mechanism as to lock and preventing the opening of valve 1, by closing valve 2, and to lock and prevent the closing of valve 2 by opening valve 1. It is only necessary in this instance to interpose a rocker arm 18 pivoted at 21, between the end of one of the levers 6, and the valve stem 4. When the valve 2 is closed, the levers 6, and rocker arm 18, take the position as shown in heavy lines, thus making it impossible to open the valve 1 as long as the valve 2 remains closed. If the valve 1 is open, valve 2 being already open, the levers 6 and rocker arm 18 will take the position as indicated in dotted lines, thus making it impossible to close valve 2, as long as valve 1 remains open.

In Fig. 3, I have shown another modified form wherein any two valves whose stems are not parallel may be so connected to my improved interlocking mechanism to lock one valve by the opening or closing of the other valve. In such cases it will only be necessary to interpose a bent or bell crank lever 19 pivoted at 22, and a connecting rod 20, between the ends of one of the levers 6, and the stem of the valve 2. The arrangement illustrated in Fig. 3, is such that the opening of the valve 2, locks and prevents the opening of the valve 1 or vice versa. If it is desired to lock valve 1 by closing valve 2, it is only necessary to change lever 19 to the position marked 24 and pivoted at 23. Then when valve 2 is closed, the levers 6 and lever 24 take the position as shown in dotted lines, thus making it impossible to open valve 1 so long as valve 2 remains closed. If valve 1 is opened, valve 2 being already open, the connected ends of levers 6 will move to the right thus making it impossible to close valve 2.

While I have shown and described my invention as applied to gas machines I wish

it to be distinctly understood that I do not limit myself to such application, nor do I limit myself to the exact details of construction as illustrated and described, since various minor changes may be resorted to without sacrificing any of the principles or advantages of my invention.

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

1. In an interlocking valve mechanism, the combination with valves and valve stems, of arms pivotally connected to the said valve stems and to each other, an abutment member coöperating with the said arms, said abutment member being adapted to lock one of the valves and prevent movement, while another is being moved to open or closed position, substantially as specified.

2. In interlocking valve mechanism, in combination with the valve stems, arms pivotally connected to the said valve stems and to each other, a guide for controlling the movement of the said arms, said guide being formed to arcs of circles diverging in opposite directions, substantially as described.

3. In an interlocking valve mechanism, in combination with the valves and valve stems, said valves and valve stems being in any relative position, arms and levers pivotally connected to the said valve stems and to each other, an abutment member coöperating with the said arms and levers so as to lock and prevent the closing of one valve so long as the other valve remains open or partly open, substantially as specified.

4. In an interlocking valve mechanism, in combination with the valves and valve stems, said valves and valve stems being in any relative position, arms and levers pivotally connected to the said valve stems, a guide for controlling the said arms and levers so as to lock and prevent the opening of one valve so long as the other valve remains closed, said guide being formed to arcs of circles diverging in opposite directions, substantially as specified.

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