

No. 627,926.

Patented June 27, 1899.

J. T. & T. C. HAYS.
ACETYLENE GAS MACHINE.

(Application filed Dec. 3, 1898.)

(No Model.)

Fig. 1.

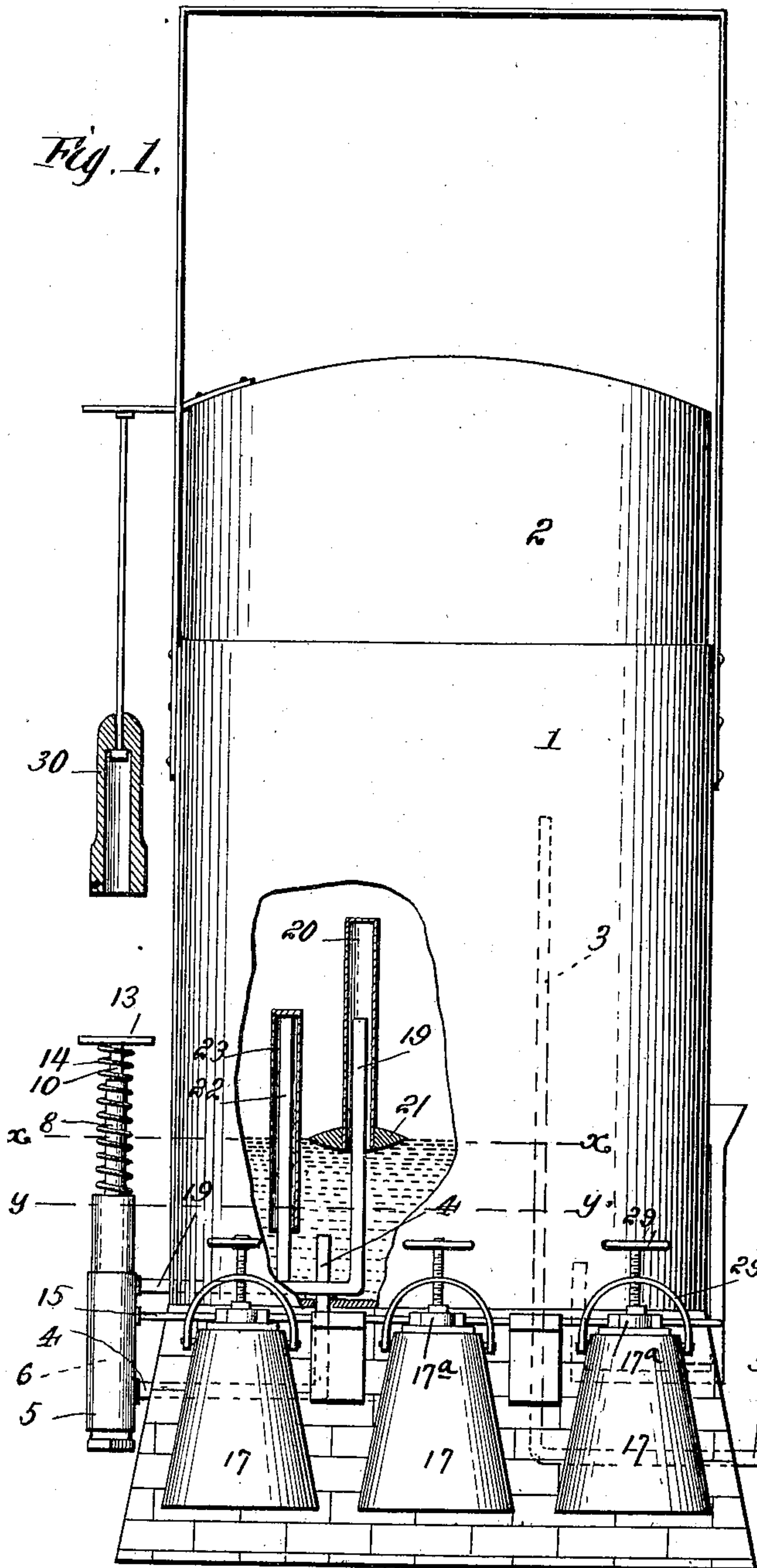


Fig. 2.

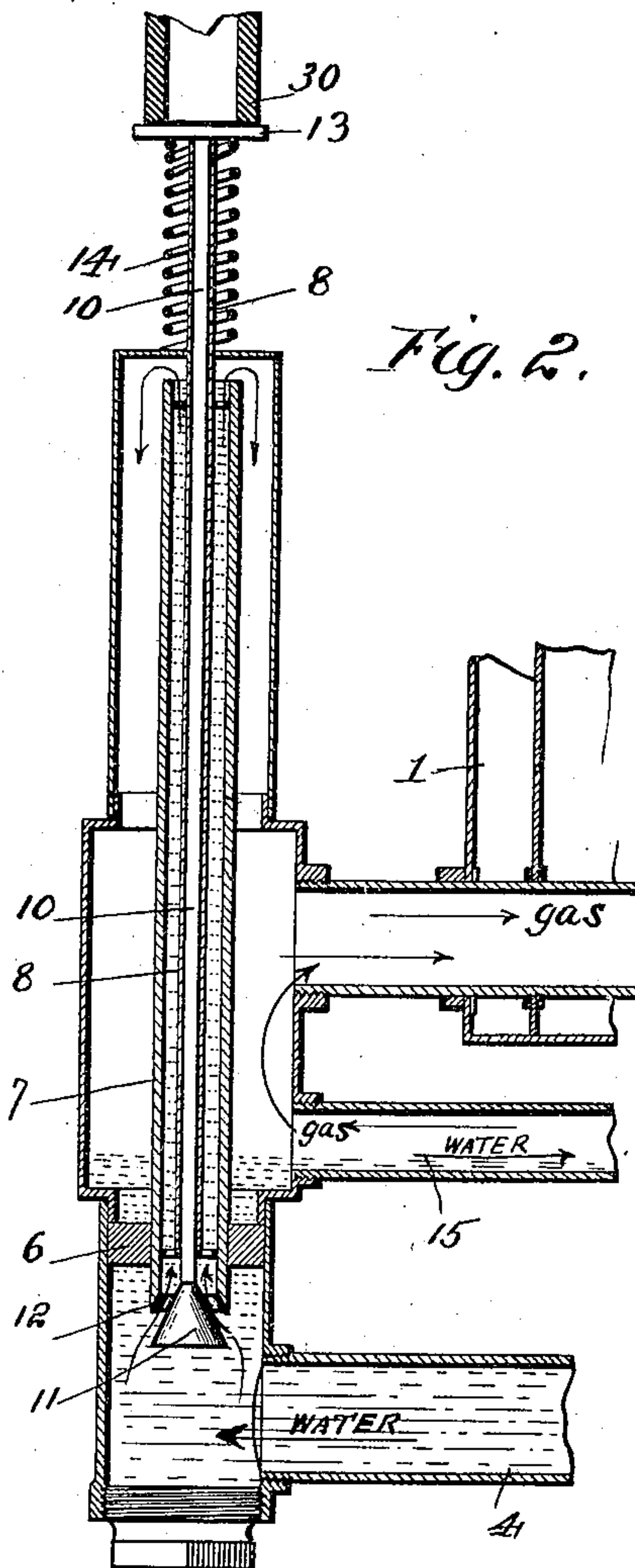


Fig. 3.

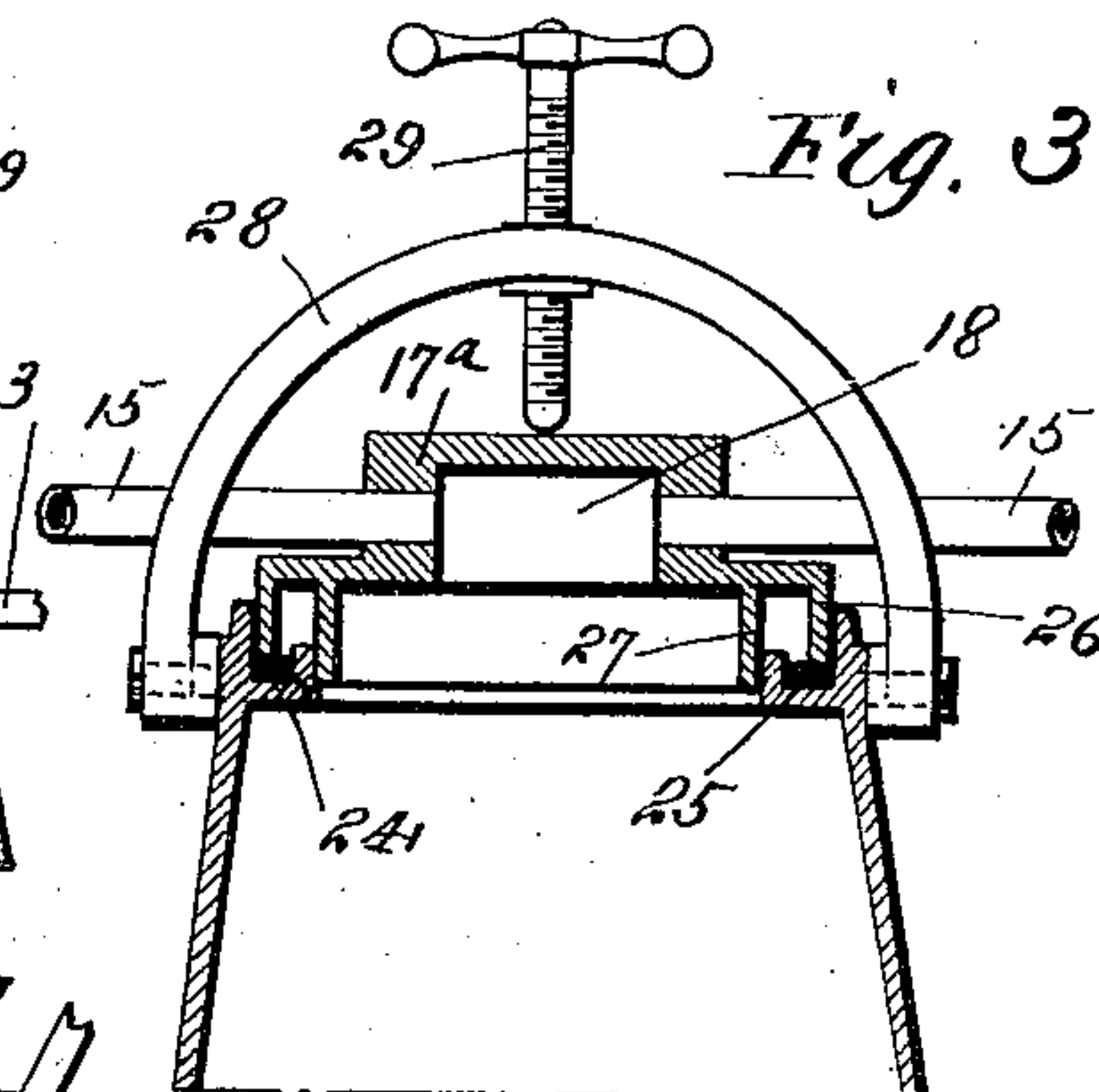
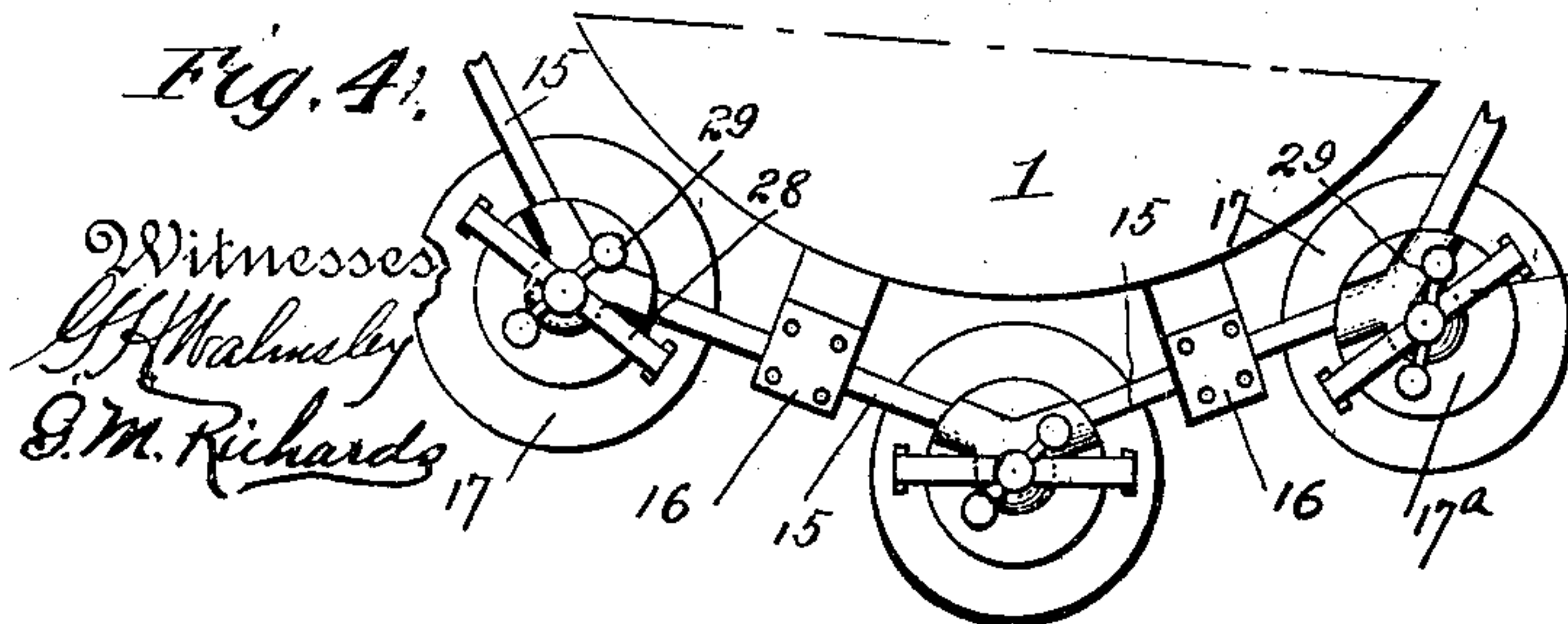


Fig. 4.



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ACETYLENE-GAS MACHINE.

SPECIFICATION forming part of Letters Patent No. 627,926, dated June 27, 1899.

Application filed December 3, 1898. Serial No. 698,214. (No model.)

To all whom it may concern:

Be it known that we, JAMES T. HAYS and THOMAS C. HAYS, citizens of the United States, residing at Emmitsburg, in the county of Frederick and State of Maryland, have invented certain new and useful Improvements in Acetylene-Gas Machines, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

Figure 1 is a side elevation of the improved apparatus, parts being broken away to more clearly show the construction. Fig. 2 is a vertical sectional view of the valve for admitting water to the carbid-retorts. Fig. 3 is a similar view of the cover of one of the carbid-retorts, and Fig. 4 is a partial plan view of the apparatus.

The object of this invention is to provide an automatic gas apparatus wherein the greatest degree of safety will be secured, combined with simplicity of construction and economical and effectual operation.

Referring to the various parts by numerals, 2 designates the vertically-movable upper part or bell of the gasometer, and 1 the lower stationary part. This latter part may be formed with double walls, between which a suitable sealing liquid may be held and into which the lower end of the bell 2 may be immersed. The lower part of the gasometer is filled to a suitable height with water, and a gas-outlet pipe 3 extends from the gas-space in the gasometer to any suitable point. From the lower portion of the tank 1 a water-outlet pipe 4 extends outward to the lower end of a vertical valve-casing 5 at one side of the tank 2 and at the lower end thereof. Just above the inlet of pipe 4 the valve-casing is divided by a horizontal partition 6, through which the lower end of an open-ended vertical tube 7 projects, the other end of said tube extending to near the upper end of the casing, but terminating below the water-level in the gasometer, for a purpose which will hereinafter appear. Mounted centrally within the tube 7 is an open-ended tube 8, within which snugly fits the valve-stem 10 of a conical valve 11, which fits the seat 12, formed on the lower end of tube 7. This valve-stem is guided accurately by the long tube 8, which is supported centrally within tube 7 by means of

suitable spiders at the ends of the tube 7 and avoids the use of a packing or stuffing box for said valve-stem, as will be presently described. The tube 8 extends through the upper end of the valve-casing to a point above the normal water-level in the gasometer, and the valve-stem extends above the tube 8 a short distance and is provided with a head 13. Surrounding the stem 10 and the tube 8 and fitting between the head 13 and the top of the valve-casing is a coil-spring 14, which normally holds the valve 11 raised against its seat 12.

From a point just above the partition 6 in the valve-casing a water and gas pipe 15 extends to the carbid boxes or retorts 17. This pipe is supported in brackets 16, carried by the gasometer or its support, and from it the retorts are suspended. These retorts are arranged in a circle around the gasometer, and the pipe 15 enters one side of the raised central portions of the covers 17^a at an angle, as shown, and opens into the hollow portions thereof and leaves said raised portions on the opposite side and extends to the next retort of the series, the retort nearest the valve-casing being connected to it by said pipe 15. By this arrangement water will flow from the valve-casing through pipe 15 until the first retort is filled up to the end of said pipe. The water will then flow on through pipe 15 to the next retort, and so on until all the retorts are full. As gas is generated in the retorts it will pass back through pipe 15 to the casing. It will be noted that as the gas passes from the retorts to the gasometer it will contact with the water in the filled retorts and in the pipe 15 and will be thereby cooled. From the valve-casing, just above the water and gas pipe 15, a gas-pipe 19 leads to the interior of the gasometer, its upper end being above the water therein. Over the upper end of this pipe fits a long tubular cap 20, which is closed at its upper end, its lower end being fitted in a large flat float 21, which rests upon the water in the gasometer and supports the cap. From the lower portion of the pipe 19 a safety-pipe 22 extends upward to a point above the water-level in the tank, and a cap 23 is placed over this pipe, the lower end of said cap extending into the water a sufficient distance to seal it and prevent the

escape of gas under normal conditions, but permit the gas to escape into the holder should there be a dangerous increase of pressure in the pipes by reason of some obstruction of the main outlet, as in our former patent, No. 609,673, dated August 23, 1898.

To facilitate the securing of the retorts to the covers, which are permanently attached to the pipe 15, each retort is formed with an inwardly-extending flange 24, which receives a packing 25, and each cover is formed with depending flanges 26 and 27, one of which bears on the packing material and the other fits the inner edge of the flange 24. Each retort is provided with a pivoted bail 28, which at its center is provided with a clamping-screw 29 and which, when the retort is in position, bears on the center of the cover and draws the retort tightly against the cover. By means of connecting the pipe 15 to the covers so that they enter the covers obliquely, within the inner circle of each, the bails may be swung up over the outer semicircles of the covers without contacting with said pipe. These bails also serve the purpose of handles by which the retorts may be readily carried about when detached from the fixed covers.

A further feature which contributes materially to the utility of the apparatus is the peculiar manner of angularly disposing the sections of the pipes 15 with respect to each other and connecting them to the permanently-supported covers within the inner semicircles thereof, this arrangement not only permitting the retorts to be quickly removed and replaced without interference with the supporting-pipe, as above set forth, but also enabling the retorts to be arranged around the gas-holder in one or more circles or in a zigzag line in any direction that the facilities of space may demand without bending the connecting-pipes. It will be observed that each cover is hollow, so that when the water fills up into the same the gas will be compelled to pass over the surface of the water as it passes through each retort, and be thereby cooled. It will also be noted that sufficient portions of the body of the cover—namely, flanges 26 and 27—extend down into the retort a sufficient distance to displace enough water to prevent overflowing when the retort is removed from the cover for cleaning out. This is an important feature, since it enables the apparatus to be run with the utmost cleanliness.

A further feature lies in the fact that the connecting-pipes are supported at intermediate points, so that any one of the retorts may be removed from its suspended position on its cover without disturbing the arrangement of piping.

Depending from the bell 2, just over the head 13 of the valve-stem, is a rod on which is supported a weight 30, which is adapted to contact with the head 13 when the bell 2 is depressed and open valve 11. This weight is hollow and is hung loosely on its supporting-

rod, so that when it has depressed head 13 until it contacts with the upper end of tube 8 the supporting-rod may move down through the weight.

The operation is as follows: As the gas is exhausted from the bell it descends until the weight 30 contacts with the head 13 and forces it down to the top of tube 8. The bell may then descend independently of the weight. When head 13 is depressed, valve 11 is opened, and water passes from pipe 4 up through tube 7, over said tube, and down to pipe 15, and then through said pipe to the retorts. When gas is generated, it passes back through pipe 15 to the valve-casing and then through pipe 19 to the cap 20. Before passing into the gasometer the gas must raise cap 20 sufficiently to permit the gas to pass under the float. By this means the gas is brought directly into contact with the water and is caused to spread out in a thin sheet over a considerable body of water, and is thereby cooled to a considerable degree. The float may be varied in area to suit apparatus of various sizes, it being desirable that the gas be caused to spread in a thin sheet and be brought into contact with as large a body of water as practicable in order to secure the cooling effect of the water. As gas raises the movable bell the weight will be raised and spring 14 will close the valve 11. As the carbide in one retort is exhausted the water will fill that retort and then flow into the next one.

It will be noted that as the water passes from the gasometer to the retorts it must pass over the upper end of the tube 7, and that therefore the upper end of said tube marks the lowest point to which the water in the tank can descend, so that the water between the normal water-level xx and the upper end of tube 7, line yy , must be sufficient to fill all the retorts connected to the machine.

The tube 8 not only serves as a guide for the valve-stem 10, but by reason of its lower end extending into the water and its upper end extending through the valve-casing and above the water-level in the gasometer it forms a water seal and avoids the use of any packing or stuffing box for the valve-stem. This is very advantageous, because as the stem and tube wear under constant use the water will maintain the seal and prevent the escape of gas.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a gas apparatus the combination of a gasometer, a water-tank, a carbide-holder, a vertical valve-casing divided into two compartments, a water-pipe connecting the lower part of said casing to the tank, an open-ended tube within the valve-casing and connecting the lower compartment to the upper compartment, its upper end terminating below the normal water-level in the tank, a valve to normally close said tube, and means operated by the descending bell of the gasometer to open

said valve, a pipe connecting the carbid-holder to the upper part of the valve-casing, and a pipe connecting said upper part of the casing to the gas-space in the gasometer.

5 2. In a gas apparatus the combination of a gasometer, a water-tank, a carbid-holder, a vertical valve-casing divided into two compartments, a water-pipe connecting the lower compartment of said casing to the tank, an
10 open-ended tube within the valve-casing and connecting the lower compartment to the upper one, its upper end terminating below the normal water-level in the tank, a valve to normally close said tube, a vertical stem con-
15 nected to said valve, an open-ended guide-tube for said stem its lower end extending below the water-level in the tank and its upper end extending above the water-level in the gasometer, means carried by the bell to
20 operate the valve, and pipes connecting the upper compartment of the valve-casing with the carbid-holder and with the gasometer.

3. The combination of a gas-holder, a water-tank, a water and gas conveying pipe con-

nected to the water-tank and gas-holder, 25 means for supporting this pipe, means for supplying water to this pipe, a series of carbid-holder covers interposed at intervals in said pipe and having their interiors in communi- 30 cation therewith, said covers being permanently supported and the sections of said pipe being angularly disposed with respect to each other and entering each cover at points within the inner semicircle thereof, a carbid-
holder for each of said covers, a bail carried 35 by each carbid-holder and adapted to swing up over the outer semicircle of the adjacent cover, and means for removably clamping the holder to the cover, the bail constituting part
of said means. 40

In testimony whereof we hereunto affix our signatures, in the presence of two witnesses, this 2d day of December, 1898.

JAMES T. HAYS.

THOMAS C. HAYS.

Witnesses:

WALTER J. RIDER;

E. L. ANNAN.