

No. 667,801.

Patented Feb. 12, 1901.

C. K. SOBER & F. E. PORTER.

ACETYLENE GAS GENERATOR.

(Application filed Aug. 8, 1900.)

(No Model.)

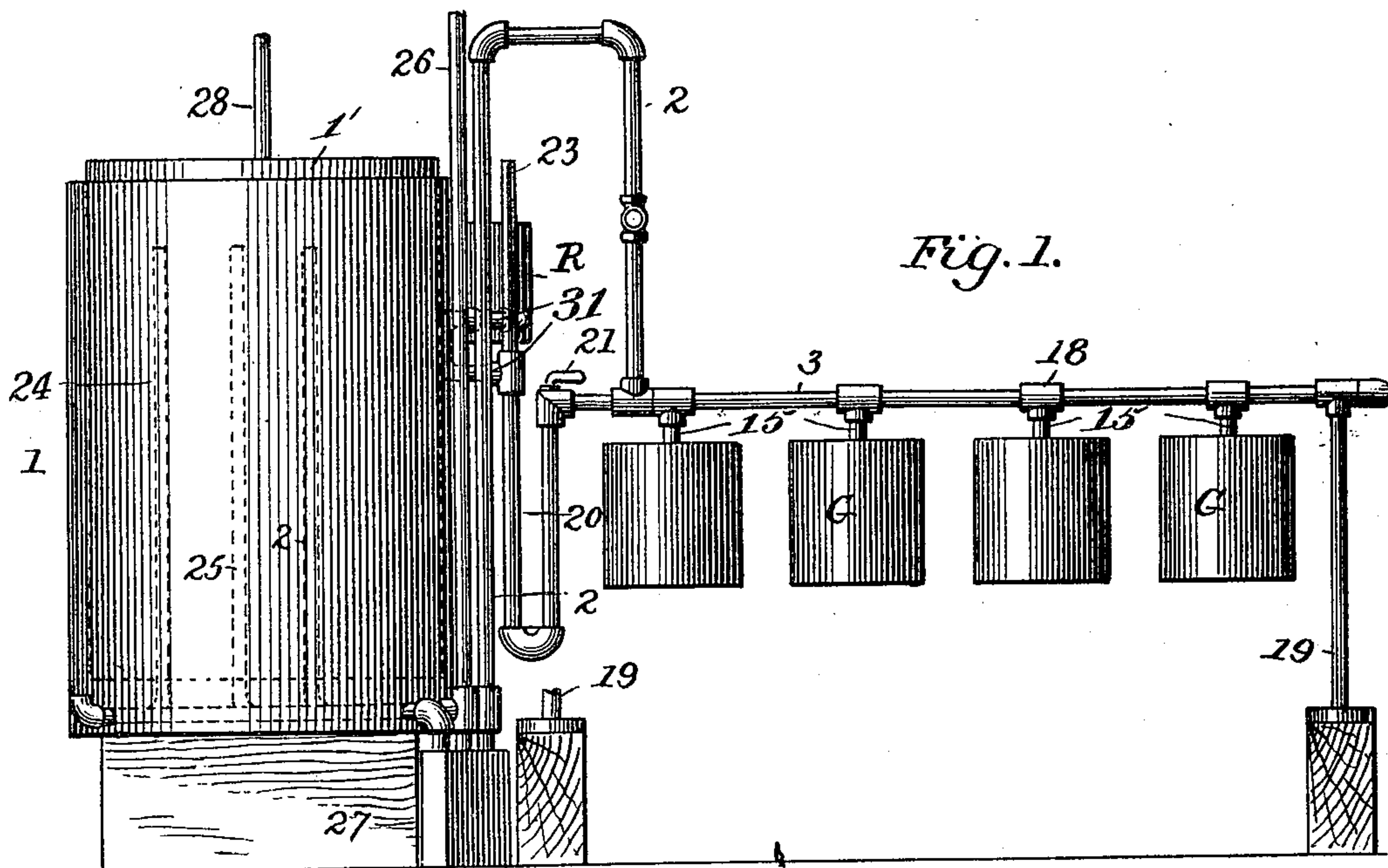


Fig. 1.

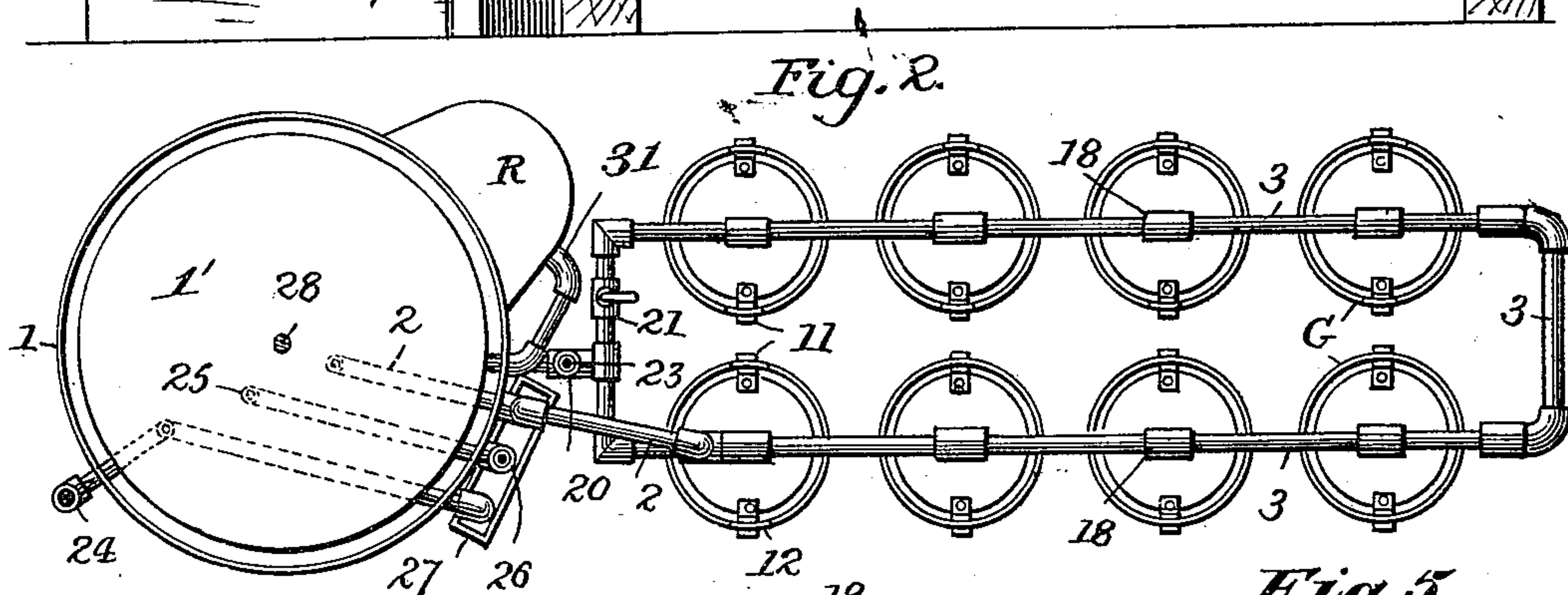


Fig. 2.

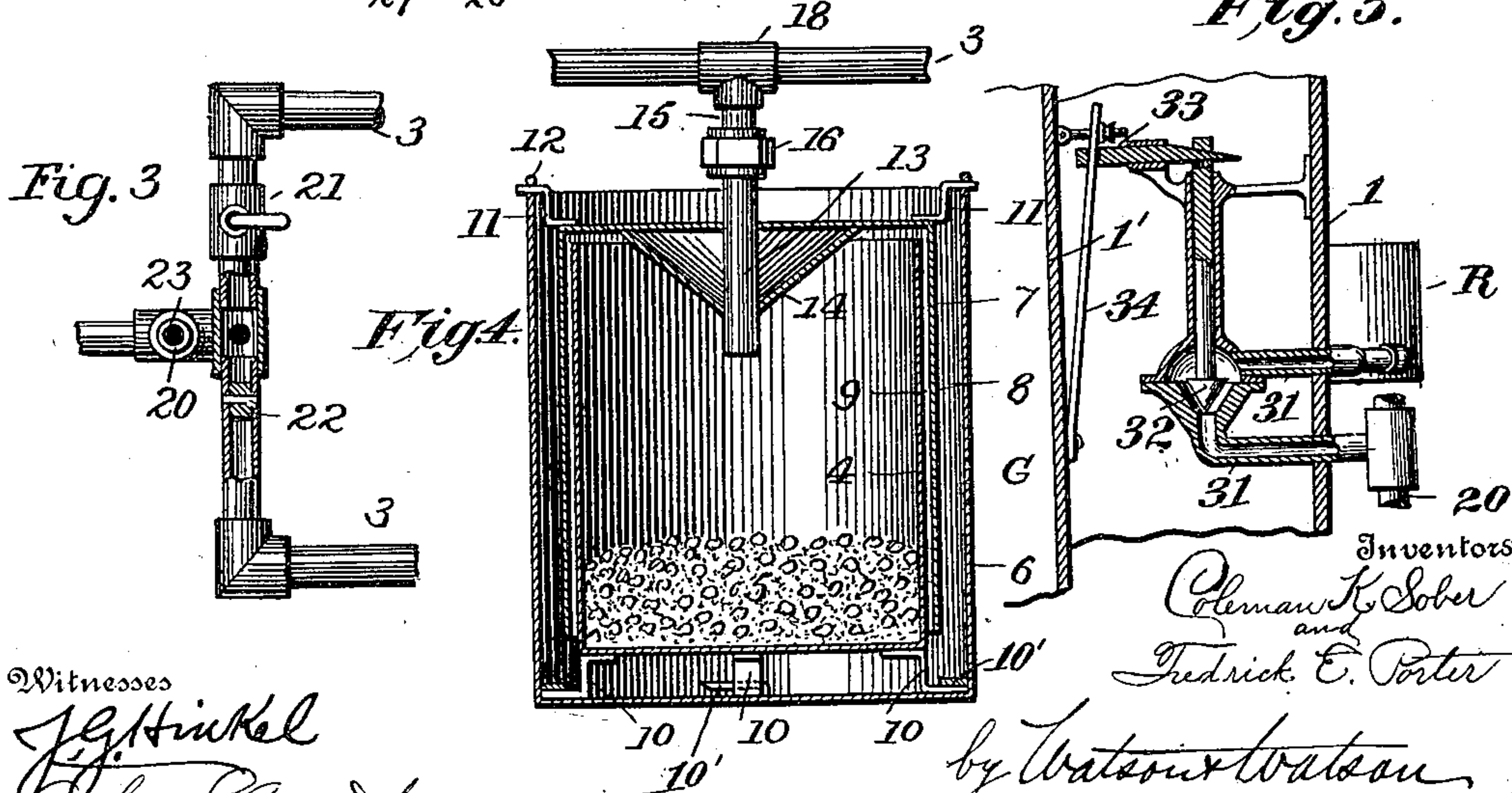


Fig. 3.

Fig. 4.

Fig. 5.

Witnesses

J. H. Hinkel
Arthur L. Bryant

Inventors
Coleman K. Sober
and
Frederick E. Porter

by Watson & Watson
Attorneys

UNITED STATES PATENT OFFICE.

COLEMAN K. SOBER AND FREDRICK E. PORTER, OF LEWISBURG,
PENNSYLVANIA.

ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 667,801, dated February 12, 1901.

Application filed August 8, 1900. Serial No. 26,281. (No model.)

To all whom it may concern:

Be it known that we, COLEMAN K. SOBER and FREDRICK E. PORTER, citizens of the United States, residing at Lewisburg, in the county of Union and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Generating Apparatus, of which the following is a specification.

This invention relates to improvements in apparatus for generating acetylene gas.

The object of the invention is to produce a generator of acetylene gas which shall be continuous in its operation and cheap and simple in construction. To this end we provide a series of generating-tanks which receive water from a common source and deliver their gas to a common holder, the said generating-tanks being adapted to be independently cleaned and recharged—that is, each tank may be cleaned and recharged without stopping the operating of the other tanks.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of an apparatus embodying the invention. Fig. 2 is a plan view of the apparatus. Fig. 3 is a detail view, partly in section, of a portion of the water and gas main. Fig. 4 is a sectional view, on an enlarged scale, of one of the generators. Fig. 5 is a detail view.

Referring to the drawings, 1 designates a gas-holder of ordinary construction, into which gas is charged by the delivery-pipe 2 of the generating apparatus. This apparatus consists of any suitable number of generators G, which are all connected with the aforesaid gas-delivery pipe 2 and with a water-reservoir R by a main 3. Each generator G comprises a bucket 4, in which the carbide 5 is placed, a tank 6, in which the bucket is centrally located, and a bell 7, the cylindrical wall of which is located between the bucket and tank. The space 8 between the bell and tank is preferably about three or four times as great as the space 9 between the bucket and bell. The bucket is provided with feet 10, which rest upon and preferably interlock with the bottom of the tank by being caused to extend beneath ears 10', secured to the tank, and the bell 7 is provided with fastening devices 11, which engage lugs 12 on

the tank, thus connecting the bell and tank together and supporting the tank from the bell. The projections 11 can be disengaged from the lugs 12 by simply twisting the tank slightly.

Centrally located in the top of each bell 7 is a vertical pipe 13, which extends through the top of the bell and into the bell a distance equal to about one-half of its height. A conical brace 14 strengthens the connection between the bell and the pipe 13 and also serves to reduce the dead-space in the bell above the mouth of the pipe. The pipe 13 is connected to a branch 15 of the main 3 by a detachable joint.

The main 3 is preferably formed of a suitable number of sections of pipe, which are connected together by T-couplings 18, to which the aforesaid branch pipes 15 are connected, there being preferably two parallel lines of such pipe-sections, which are joined at their ends by suitable cross-pipes. The main 3 is also connected with suitable legs or standards 19, and thus forms the upper end of a supporting-frame by which the generators G are carried. By this construction the support for the generators can be readily adapted to receive any desired number of generators.

The water-reservoir R is preferably supported on the gas-holder 1 and is connected with the main 3 by suitable pipes, including a dip or U-shaped duct 20. As shown, a pipe 31 connects the reservoir R with the U-shaped duct 20, said pipe 31 extending at intermediate points in its length through the side or wall of the tank 1 of the gas-holder into the space between said tank and the vertically-movable bell therein. A valve 21, provided with a suitable handle, is arranged in the main 3 at one side of its connection with the water-pipe 20, and in said main on the other side of said connection with the water-pipe is fitted a plug 22, so that water can only flow through said pipe and to the generators in the direction of the valve 21. The water-supply pipe 20 is provided with an upwardly-extending vent-tube 23.

The gas-delivery pipe 2 is connected with main 3 at a point between the plug 22 therein and the last of the series of generators, and

said delivery-pipe is preferably made in the form shown in the drawings—that is, it extends first upwardly and then downwardly to enter the gas-holder near the lower end, the discharge end of said pipe extending upwardly a suitable distance within the holder. Within the gas-holder 1 is also arranged a branch 24 of the gas-distributing pipe, by which the gas is conducted to the place where it is to be used. One branch of a gas “blow-off” or vent pipe 25 is arranged within the gas-holder, the other branch 26 of said pipe extending out and to a suitable elevation and distance from the apparatus. Each of said pipes 2, 24, and 25 is provided with a drip-tube 30, that extends into a tank 27, arranged at the lower end of the gas-holder. A sufficient quantity of water is maintained in said tank 27 to seal the lower ends of said drip-tubes, and by means of such tubes any particles of water that may be carried from the generators with the gas will be withdrawn.

For automatically governing the flow of water to the main 3 and generators G we arrange a valve 32 in the pipe 31 within the tank 1, by which water from the reservoir R is supplied to the pipe 20, and connect said valve with the movable bell of the gas-holder, so that as said bell rises the valve will be gradually closed, and as gas is withdrawn from the holder and the bell thereof descends the valve will be opened and water admitted to the main 3 and generator G. Any suitable form of valve may be employed; but at present we prefer to use one similar to that illustrated and described in Patent No. 623,425 of F. E. Porter. As shown in Fig. 5, the stem of the valve 32 is provided with a transverse aperture near its upper end, through which extends the wedge-shaped end of a thrust-rod 33. This is mounted in a suitable guide or holder and adjusted longitudinally by the vertical movements of the bell of the gas-holder. As shown, an inclined rod 34 is connected to and moves vertically with the bell 1' of the gas-holder, its upper end being adjustably connected to said holder by a threaded rod or nut. As the bell of the gas-holder is raised by the pressure of gas therein the thrust-rod 33 will be withdrawn more or less from the passage in the valve-stem and the valve will close by gravity. As the supply of gas within the holder is reduced and the bell thereof descends the thrust-rod will be moved toward the valve-stem, thereby raising the valve from its seat and permitting water to flow from the reservoir R into the main 3 through the pipe 20.

A guide-rod 28 is provided for the movable bell of the gas-holder.

The operation is as follows: The carbid-buckets 4 of the generators G can be detached by simply unlocking the couplings 11 12. In starting the machine the buckets are all removed and suitably filled with carbid. They are then replaced in the generators, as shown

in the drawings, and the spaces 8 9 are filled with water, the water being poured into the tanks 6 until the spaces 8 are two-thirds full. The valve 21 is now opened to admit water to the main 3 beyond said valve and to the pipe 13 of the first of the series of generators. As soon as the water reaches the carbid gas is generated, which flows out through the same pipe 13 by which the water enters and through the main 3 to the pipe 2, by which it is conducted to the gas-holder 1. When the carbid in the first generator is spent, the water will rise therein until it reaches the mouth of pipe 13, whereupon no more water will enter that branch; but water entering the main will flow on to the next of the series of generators. No overflow from the generator-tanks can therefore occur and the generators are successively brought into action.

By making the space 9 considerably smaller than the space 8 the level of the water may be forced down in 9 without proportionately raising the water in 8. We are thus enabled to create considerable hydrostatic pressure in the generators, sufficient to force the gas into the tank and prevent leakage from the generators. The dip in the water-supply pipe 20 prevents any gas from passing to the water-reservoir.

It will be seen that the liquid seal between the bucket 4 and tank 6 effectually prevents the admission of the atmosphere to the contents of the bucket or the escape of gas from such bucket. Said seal may be formed by oil, glycerin, or any other suitable liquid, as well as by water, as above described.

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

1. In apparatus of the class described, the combination with a water-supply and gas-delivery main, of a generator-tank, a carbid-bucket within the tank, a bell having its vertical wall extending between said bucket and tank, a pipe leading from the main into said bell, a cone-shaped brace, 14, surrounding the pipe within the bell and permanently connecting said parts together, and means secured to the bell for engaging with the tank and supporting it and the carbid-bucket therefrom, substantially as described.

2. In apparatus of the class described, the combination of a water-supply and gas-delivery pipe, a generator-tank adapted to hold water, a carbid-bucket arranged within the tank and supported by feet, 10, adapted to be detachably engaged with stops, 10', within the tank, to prevent vertical movement of the bucket therein, a bell extending over the bucket and between the side walls of the bucket and tank, said bell having at its upper end projections, 11, adapted to extend beneath lugs, 12, at the upper edge of the tank, and a pipe permanently connected to the bell and adapted to be detachably connected with the main, substantially as described.

3. In apparatus of the class described, the combination of a gas-holder, a horizontal frame composed of a series of tubular sections connected together by T-couplings, a
5 generator connected with the depending branch of each of said couplings, a water-reservoir, pipes or ducts connecting said frame with the water-reservoir and the gas-holder, a plug in said frame between the water and
10 gas connections, and means for regulating the

flow of water from the reservoir to said generator-support.

In testimony whereof we affix our signatures in presence of two witnesses.

COLEMAN K. SOBER.
FREDRICK E. PORTER.

Witnesses:

WM. R. FOLLMER,
W. J. WILKINSON.