No. 864,215. PATENTED AUG. 27, 1907.

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ACETYLENE GAS MACHINE.

APPLICATION FILED AUG. 14, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

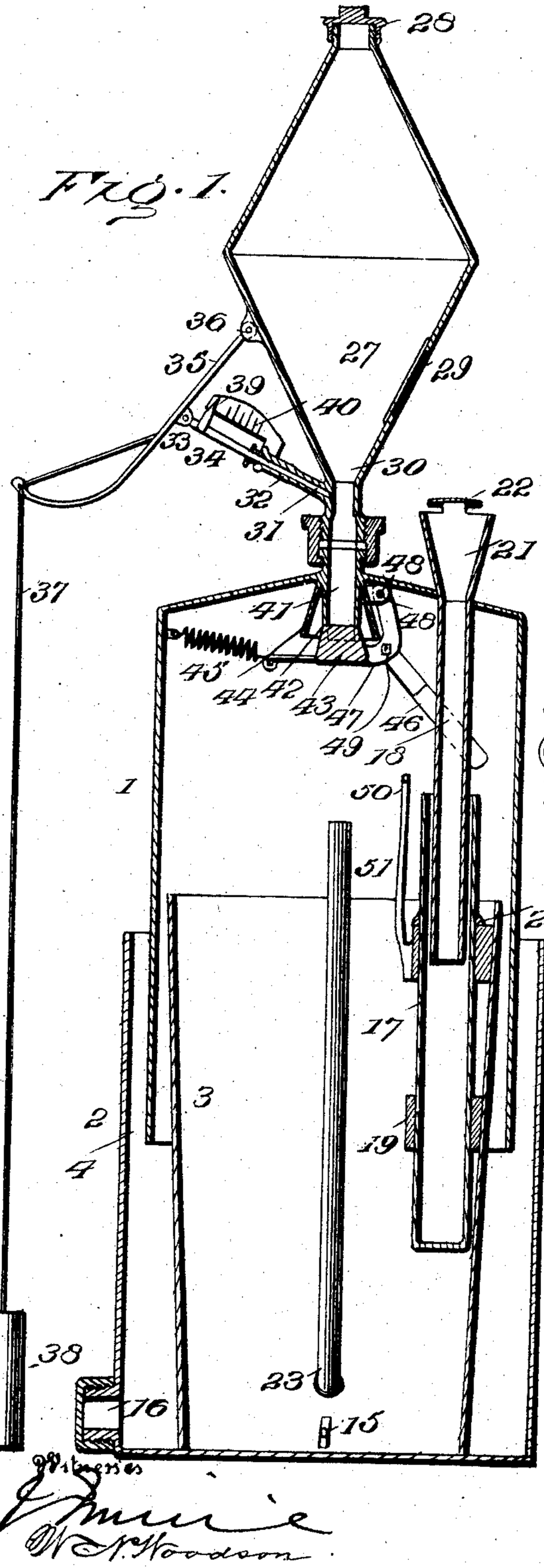

Fig. 5.

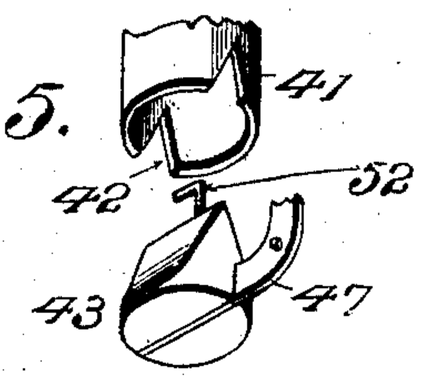

Fig. 3.

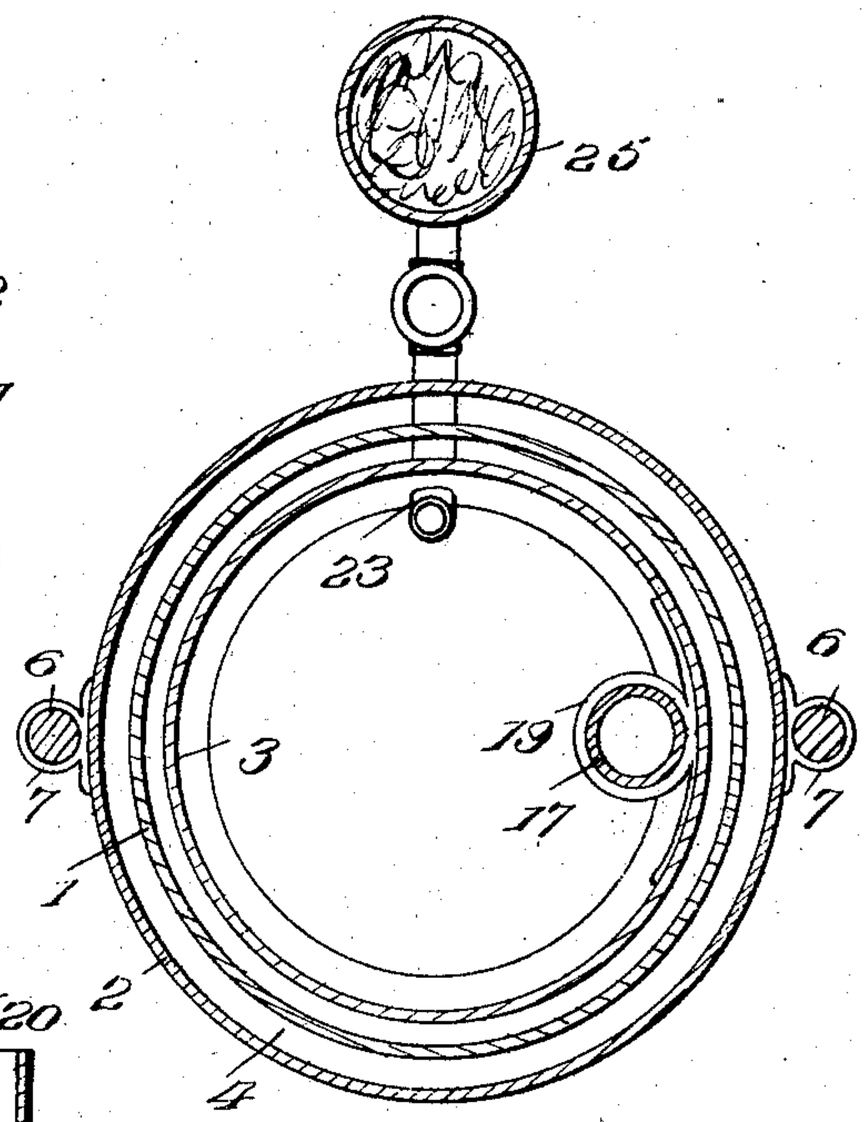

Fig. 4.

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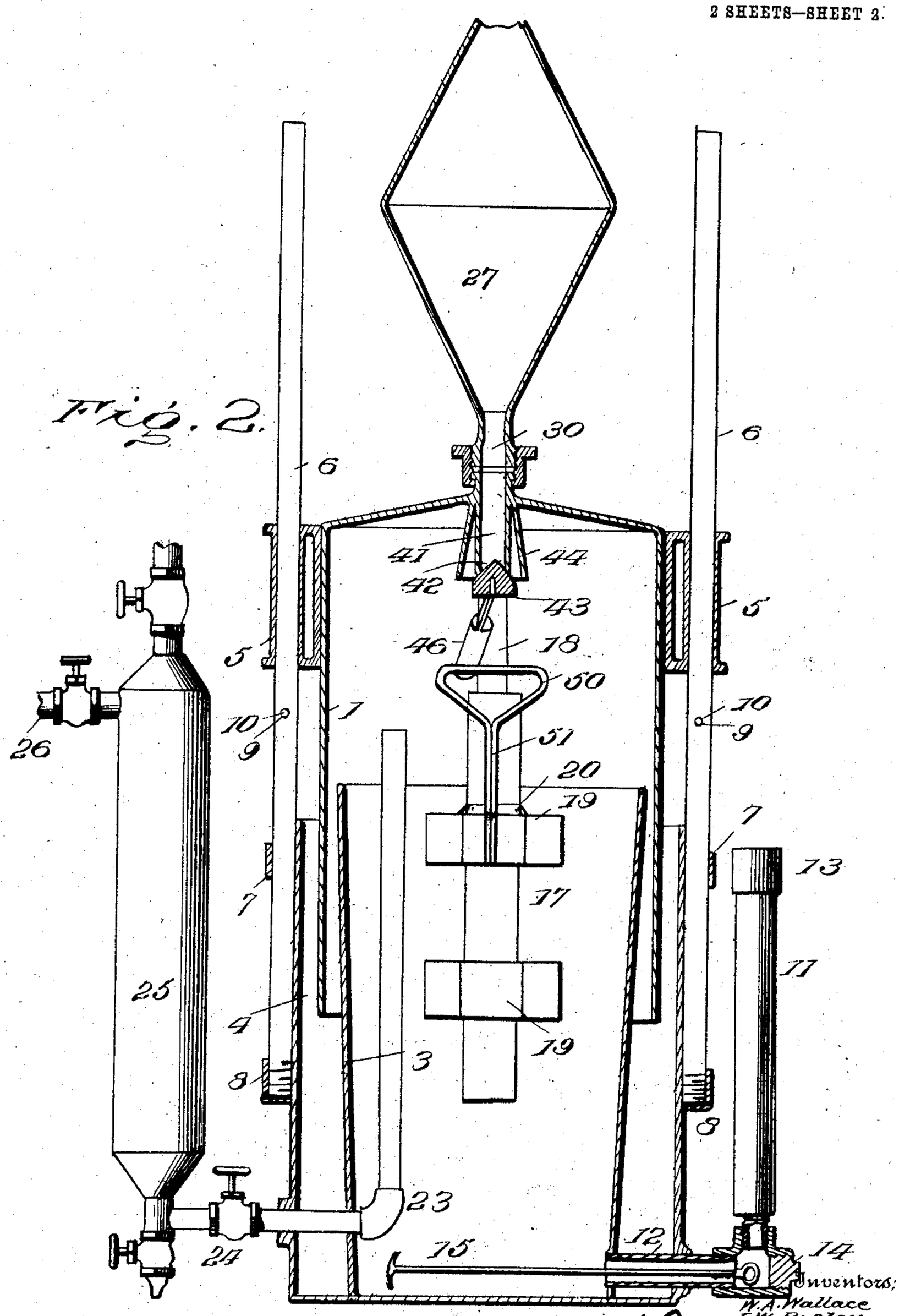
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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ACETYLENE-GAS MACHINE.

No. 864,215. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed August 14, 1906. Serial No. 330,584.

To all whom it may concern:

Be it known that we, WILLIAM A. WALLACE, LEE WOODEN BOSLEY, and DANIEL O. BOSLEY, citizens of the United States, residing at Gainesville, in the county of Cooke and State of Texas, have invented certain new and useful Improvements in Acetylene-Gas Machines, of which the following is a specification.

One of the chief purposes of the present invention is the provision of a machine which will automatically feed different grades of carbid successfully in variable quantities according to the amount required, whether the machine be large or small.

A further purpose of the invention is to obviate the difficulty usually met with in the operation of acetylene machines due to clogging of the valves, the difficulty being overcome in the present instance by positive operation of the valve employed for regulating the feed of the carbid, said valve being positively actuated both when opening and closing. And a further purpose of the invention is to provide means for automatically shutting off the supply of carbid in the event of an overproduction of acetylene and which cannot escape by the vent, the cut-off being automatically operated by the abnormal elevation of the gas bell.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a vertical central section of an acetylene gas machine embodying the invention. Fig. 2 is a vertical sectional view with parts in side elevation, the machine being viewed at right angles to the position illustrated in Fig. 1. Fig. 3 is a horizontal sectional view of the said machine. Fig. 4 is a detail perspective view of the trip valve. Fig. 5 is a detail view of a modified form of trip valve.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

As is customary in machines for generating acetylene, a gasometer is provided comprising a bell 1, tank 2 and inner shell 3, a space 4 being provided between the outer wall of the tank 2 and the shell 3 to receive a liquid seal into which the body portion of the bell 1 extends. It is preferred to supply the space 4 with crude oil or like liquid which will not freeze in extremely cold weather. The inner shell 3 is upwardly flared so as to make provision for expansion of ice in the event of the water contained in the tank or lower portion of the gasometer freezing. The gasometer likewise constitutes a generator, the space inclosed by the inner shell 3 and the bottom of the tank 2 receiving a quantity of water which produces a chemical reaction upon the calcium carbid to evolve the acetylene which collects in the upper portion of the gasometer and is carried off therefrom for use both in heating and illuminating. The bell 1 is directed in its vertical movements by means of guide sleeves 5 provided at opposite sides near the upper end thereof, and guide rods 6 which are secured to opposite sides of the tank 2. Keepers 7 are located at opposite sides of the tank 2 near the upper ends thereof and internally threaded sockets 8 are attached to opposite sides of the tank in vertical alinement with the respective keepers 7 to receive the lower threaded ends of the guide rods 6 after the same have been thrust through the keepers 7. Openings 9 are provided in the guide rods 6 and are adapted to receive a pin or like instrument to admit of tightening or loosening said rods, as also to receive pins 10 for holding the gas bell 1 elevated when cleaning and otherwise priming the machine preliminary to placing the same in commission. A pipe 11 is provided at its lower end with a branch 12 which extends through the tank 2 and inner shell 3 and communicates with the interior of the gasometer adjacent to the bottom so as to carry off dross and other accumulation, as well as to permit of draining the gasometer when it is required to clean the same. A cap 13 closes the upper end of the pipe 11, whereas a plug 14 closes the outer end of the branch 12. When the pipe 11 is turned into vertical position and the cap 13 removed, water may be poured into the upper end of the pipe and directed thereby into the tank through the branch 12. To draw off the spent water or to drain the gasometer when desired, the pipe 11 is turned into horizontal position and the cap 13 removed, or the plug 14 may be displaced from the outer end of the branch 12 and in either case the water will readily pass off from the gasometer as will be readily understood. The residue accumulating in the lower portion of the gasometer and not passing off with the liquid through either the branch 12 or the pipe 11, may be removed by means of a scraper 15, which is inserted into the tank through the branch 12, said scraper consisting of an operating stem and a blade. The scraper may remain in the lower portion of the tank or may be placed in any convenient porsition for use when it is required to clear the bottom of the tank from dross and other heavy accumulation.

The crude oil or other liquid forming the seal in the space 4 between the tank and gas bell, is adapted to be drawn off through an outlet 16 provided at the lower end of the tank 2 and consisting of a coupling closed by means of a cap or like part. To prevent dangerous

pressure within the gasometer, an automatic relief is provided, the same consisting of complemental pipes 17 and 18 attached to, respectively, the tank and the gas bell. The pipe 17 is closed at its lower end and open at its upper end and is removably fitted to the inner shell 3 of the tank, being supported in brackets 19 attached to the shell 3 and having a collar or shoulder 20 near its upper end to extend over the upper bracket to support the pipe when in proper position. The pipe 18 is open throughout its length and connects at its upper end with a funnel 21 provided upon the top of the gas bell 1 and which funnel has a deflector 22 at its upper end in vertical line with the pipe 18 so as to arrest any liquid that may be thrown upward through the pipe 18 by downward pressure of the gas upon the liquid contained in the pipe 17. The space surrounding the deflector 22 provides ready escape for an overproduction of gas, the funnel 21 being sufficiently large to contain a quantity of liquid, which when the dangerous pressure is relieved passes back into the pipe 17 through the pipe 18 to provide a slide between the two pipes to prevent waste of the gas under normal conditions of the machine.

A pipe 23 enters the lower portion of the gasometer and extends upward therein into the space of the gas bell and is designed to carry off the gas. A valve 24 is provided in the length of the outflow pipe 23 to regulate the passage of the gas from the machine. A filter 25 is arranged exterior of the gasometer and the outflow pipe 23 connects with the lower end thereof. A service pipe 26 connects with the upper portion of the filter and may be provided with suitable outlets and fixtures according to the use to which the acetylene is to be put. The filter 25 consists of a cylinder or drum having opposite ends contracted and terminating in tubular extensions provided with regulating valves to admit of supplying and draining the filter as may be required.

The carbid holder 27 consists of a receptacle tapered towards opposite ends and adapted to be supplied with the gas produicng material at its upper end which is closed by means of a cap 28, said receptacle being provided in a side with an observation opening 29 protected by mica or other transparent material. The holder 27 is detachably fitted to the upper portion of the gas bell at a central point and its lower contracted end 30 is provided with a gate or cut-off 31 slidable laterally in a guide 32 having a stem 33 at its outer end through which operates the stem 34 of the gate or cut-off 31, a stuffing box being provided at the outer end of the stem 33 to insure the formation of a tight joint between the stems 33 and 34. The gate or cut-off 31 inclines to the horizontal so as to prevent the calcium carbid lodging thereon and to facilitate the movement of the gate when operated to cut off the feed. A lever 35 is hinged or pivotally connected at 36 to a side of the holder 27 and has the outer end of the stem 34 pivoted thereto. A cord or chain 37 has adjustable connection with the outer or lower end of the lever 35 and is provided at its lower end with a weight 38, the parts being so adjusted that upon abnormal ascent of the gas bell, the weight 38 will draw upon the lever 35 and effect movement of the gate or cut-off 31 so as to completely shut off feed of the carbid. To determine the extent of adjustment of the gate or cut-off 31, a pointer 39 is provided upon the stem 34 and the guide or casing 32 is provided with a graduated arm 40 with which the pointer 39 coöperates. The frictional engagement between the parts 31, 32, 33 and 34 is such as to hold the gate or cut-off 31 in the adjusted position.

A tube 41 is provided centrally of the gas bell 1 and the lower end of the carbid holder makes detachable connection therewith. The lower end of the tube 41 is formed in opposite sides with a V notch which provides a seat 42 of corresponding shape against which a trip valve 43 of inverted V-form upwardly closes. A deflector 44 is fitted to the lower portion of the tube 41 above the valve seat and is outwardly and downwardly flared and prevents moisture collecting on the tube 41 finding its way to the valve and the valve seat. The inverted V-form of the valve 43 serves to divide the carbid and direct the same equally to opposite sides of the gasometer. The valve is held seated either by means of a spring 45 or a weighted arm 46 or by the combined action of both. The spring 45 exerts a pulling force, whereas the weighted arm 46 causes the valve to seat upward. A bell crank 47 pivoted at 48 to lugs extended outward from the tube 41, supports the valve 43 and is provided with the weighted arm 46 which is detachably connected thereto by means of a fastening 49. The weighted arm 46 extends into the path of a trip connected with the tank of the gasometer, said trip consisting of a head 50 and the stem 51, the latter being attached to the inner ends of the brackets 19 and the head 50 projecting laterally from opposite sides of the stem. The trip is preferably formed of a piece of stout wire doubled upon itself to form the loop-shaped head 50 and having its end portions brought together to form the stem 51 which is soldered or otherwise made fast to the upper bracket 19.

When it is required either to clean the machine or to recharge the carbid holder, the gas bell 1 is moved upward upon the guide rod 6 until the guides 5 clear the openings 9, after which pins 10 are inserted in the openings 9 to hold the gas bell elevated. The closer 28 may be removed from the upper end of the holder 27 and the latter supplied with a quantity of the carbid, after which the closer 28 may be replaced. The liquid constituting the seal between the parts 1 and 2, may be poured into the space 4 between the body of the tank and the inner shell 3. Water may be supplied to the tank through pipes 11 and 12 in the manner stated. The gate or cut-off 31 is moved by hand to the desired position to regulate the feed of the carbid from the holder. The pins 10 are now removed and the gas bell permitted to descend, the arm 46 coming in contact with the trip, unseating the valve 43 and permitting a quantity of carbid to enter the tank of the gasometer when acetylene will be evolved by the reaction produced by the chemical action between the carbid and water. The gas rising and accumulating in the upper portion of the gasometer soon reaches a pressure to overcome the resistance produced by the weight of the bell 1 and adjunctive parts and causes said bell to rise, thereby carrying the arm 46 away from the trip and permitting the valve 43 to close and shut off the supply of carbid. Should an overproduction of gas result, the excessive pressure is relieved when the gas bell reaches a predetermined point in its elevation through the pipes 17 and 18 in the manner stated heretofore, but should said relief be insufficient, a continued ascent

of the gas bell will cause the weight 38 to come into play and shut the gate or cut-off 31. This latter feature is an emergency safety appliance and seldom comes into play, the relief being usually sufficient for providing an escape for any excessive pressure. As the pressure within the gasometer is reduced by consumption of the gas at one or more outlets connected with the service pipe 26, the gas bell 1 proportionately descends until when near the limit of its downward movement the arm 46 again comes in contact with the trip and the valve 43 is unseated, thereby permitting a supply of carbid to enter the tank when the operation before described takes place. The gate or cut-off 31 provides for regulating the supply of carbid to the gasometer when the valve 43 is unseated. The gas, in its passage through the filter 25, is purified.

The trip valve shown in Fig. 5 is provided with a blade 52 which materially assists in the seating of the valve by cutting through the carbid or pushing the same aside. The blade 52 is of essential advantage since it will cut through any crust that may form from the action of moisture on the carbid.

Having thus described the invention, what is claimed as new is:

1. In a machine of the character specified, the combination of a gasometer comprising a tank and a gas bell, a carbid holder having connection with the gas bell and having an outlet terminating in a valve seat of V-form, a valve of inverted V-form adapted to close upward against said seat, a weighted arm normally exerting a pressure to hold the valve seated, and a trip for actuating the weighted arm to effect unseating of the valve.

2. In a machine of the character specified, the combination of a gasometer comprising a fixed tank and a movable gas bell, a carbid holder connected with the gas bell, a valve mechanism for effecting discharge of the carbid and controlled by the vertical movements of the gas bell, a regulating valve for controlling the quantity of carbid discharged in a given time, and means for automatically closing said regulating valve when the gas bell tends to rise above a predetermined elevation.

3. In a machine of the character specified, the combination of a gasometer comprising a fixed tank and a movable gas bell, a carbid holder connected with the gas bell, a valve mechanism for effecting discharge of the carbid and controlled by the vertical movements of the gas bell, a regulating valve for controlling the quantity of carbid discharged in a given time, means for determining the extent of opening said regulating valve, the same consisting of a pointer and an arm provided with scale graduations, and means for automatically closing the regulating valve in an abnormal ascent of the gas bell.

4. In a machine of the character described, the combination of a gasometer comprising a fixed tank and a movable gas bell, a carbid holder supported on the gas bell, and provided with a contracted feed passage leading to the gas bell, a valve mechanism within the gas bell and adapted to automatically control the discharge of the carbid from the holder, a cut-off adapted to project to a greater or less extent across the contracted feed passage of the holder, a support projecting from the holder and in which the said cut-off is slidingly mounted, a lever fulcrumed on and depending from the carbid holder and operatively connected to the cut-off, and a weight connected to the outer end of said lever and adapted to swing the latter downwardly when the carbid holder is raised beyond a predetermined level, whereby to move the cut-off across and completely close the discharge passage of the carbid holder.

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

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LEE WOODEN BOSLEY. [L. S.]
DANIEL O. BOSLEY. [L. S.]

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