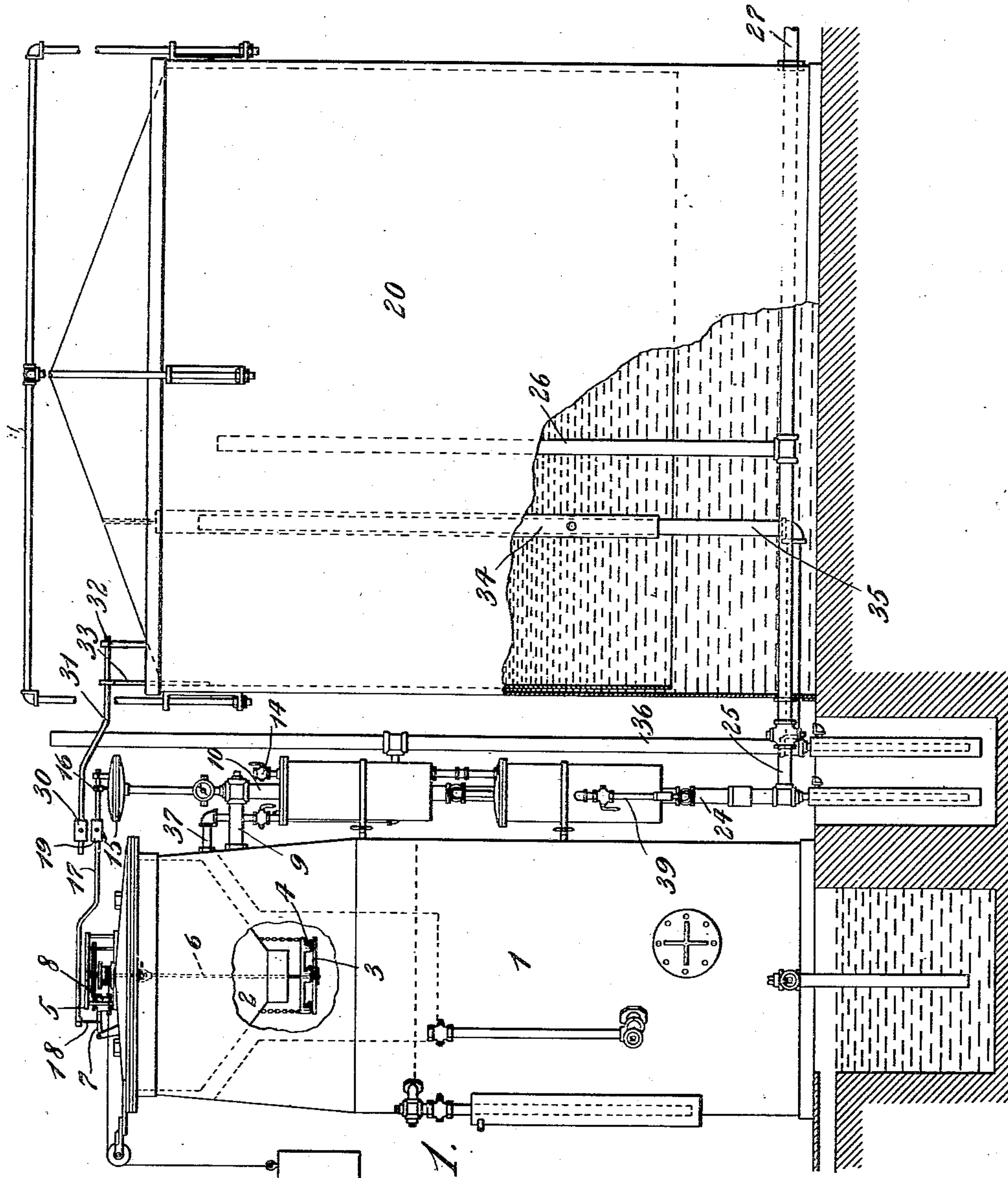


A. DAVIS.
ACETYLENE GENERATING APPARATUS.
APPLICATION FILED APR. 16, 1909.

940,437.

Patented Nov. 16, 1909.

2 SHEETS—SHEET 1.



WITNESSES:

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Fig. 1.

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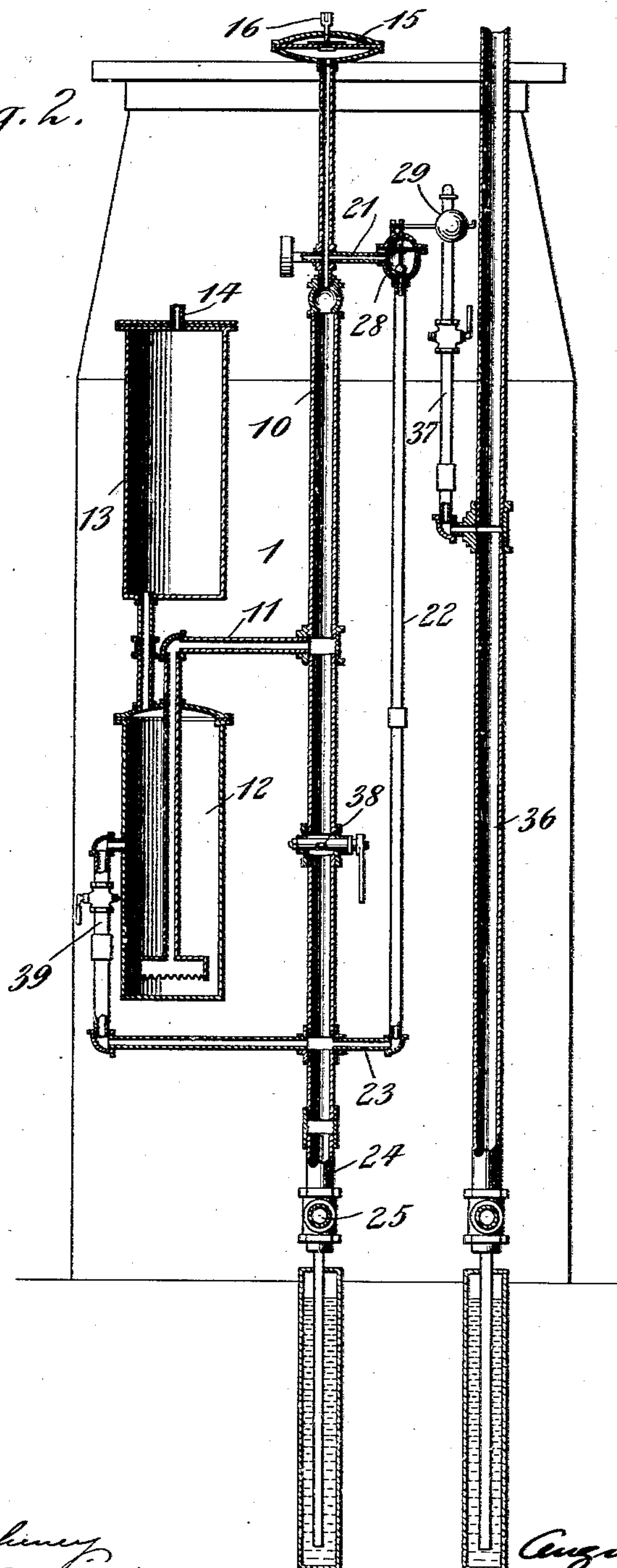
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2 SHEETS—SHEET 2.

Fig. 2.



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AUGUSTINE DAVIS, OF EAST ORANGE, NEW JERSEY.

ACETYLENE-GENERATING APPARATUS.

940,437.

Specification of Letters Patent.

Patented Nov. 16, 1909.

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To all whom it may concern:

Be it known that I, AUGUSTINE DAVIS, a citizen of the United States, residing in East Orange, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Acetylene-Generating Apparatus, of which the following is a specification.

The object of the invention is with a single generator to obtain the results of two generators, a pressure generator such as used for welding and a generator of the bell type such as used for lighting. In the pressure type of generator the evolution of gas is stopped and started again as the pressure in the generator rises and falls with respect to a predetermined degree of pressure. This is accomplished desirably by regulating the carbid feed by the movement of a pressure diaphragm. In the type of generator used for lighting the evolution of gas is controlled by the rising and falling of a bell. In other words, one type of generator is designed to maintain a certain pressure, and the other a certain volume.

The present invention consists in the co-operative association of a pressure generator and a gasometer in such a way that the apparatus is practically a combination of two generators as set forth. A gasometer, it is needless to state, is a receiver the capacity of which varies according to the volume of gas at constant pressure therein. The usual and desirable construction is a bell that rises and falls in water.

In the accompanying drawings illustrating one of the possible arrangements of the apparatus, Figure 1 is a side elevation of a pressure generator and a gasometer and connections, and Fig. 2 is a view of the connections, in vertical section, taken at the right of the generator and looking toward the left.

It should be premised that the essential novelty of the invention resides in the new arrangement and association of instrumentalities whereby new results are attained, and that the particular form of the several elements is a matter of indifference.

Referring now to these drawings, the numeral 1 designates a pressure generator. That illustrated is of a well-known design in which the carbid descending from a hopper 2 is received upon a rotatable plate 3, associated with which are stationary displacers 4. The plate 3 is adapted to be

rotated by a weight motor 5, through a vertical shaft 6. A stop lever 7 coöperates with a notched fan 8 adapted to be rotated by the weight of the motor. When the lever 7 is in the position indicated in Fig. 1 the motor is stopped; but when the lever is depressed its end stands opposite the notched portion of the fan, permitting the fan and motor to operate, thus rotating the plate 3 and causing lumps of carbid to be pushed off by the deflectors 4 into the water below. The gas is taken out through pipes 9, 10 and 11, flash-back chamber 12, scrubber 13, and connection 14 to service, as to a welding torch.

In communication with the interior of the generator, as by being connected with the upper end of pipe 10, is a pressure diaphragm 15, connected at 16 with a weighted lever 17, which in turn is connected by a link 18 with the stop lever 7. The weight 19 may be shifted along the lever 17, as is well understood, to adjust the weight imposed upon the top of the diaphragm in position to the gas pressure acting against the under side thereof. When the pressure falls below a predetermined degree, the diaphragm falls, lowering the levers 17 and 7, and permitting the motor to operate. When the pressure rises, the diaphragm and levers are elevated and the motor is stopped.

As far as the present application is concerned all of the foregoing is old *per se*. While the structure of the pressure generator illustrated has been described with some particularity, it should be understood that this is merely for sake of a clear exposition of the operation of the whole assemblage, the remainder of which is to be described. And as has already been suggested the particular form and design of the pressure generator is immaterial.

The numeral 20 designates a gasometer or gas-holder. It is connected with the gas space of the generator 1 by any suitable piping, as pipes 9, 10, 21, 22, 23, 24, 25 and 26, the last discharging above the level of the water in the gasometer. An extension 27 of pipe 25 connects the gasometer with pumping apparatus, a lighting system, or other service for which low pressure is desirable.

The feature of importance as to the connection between the generator and the gasometer is the provision of a pressure-operated valve 28. This valve is capable of being set for a higher pressure than the pres-

sure control mechanism for the generator feed, and in operation the two pressure devices must be so relatively set. The pressure at which the valve 28 opens is decided by the position of the adjustable weight 29. Thus, the diaphragm 15 may be set for five pounds and the valve 28 for eight pounds; but the degree of pressure is immaterial to the present invention as long as the diaphragm 15 is set for a lower pressure than the valve 28.

The next feature of importance is the provision of means whereby the bell of the gasometer in falling temporarily increases the setting of the pressure control mechanism for the generator feed to that of the valve 28; with the result that more gas is evolved in the generator, causing the pressure therein to rise until the valve 28 opens, thus replenishing the gasometer. A suitable instrumentality includes a weight 30, carried by a lever 31, in turn mounted on the bell of the gasometer. The lever 31 is desirably pivoted near its rear end, as at 32, either to the gasometer bell or to a fixed support, and intermediate the pivot and weight rests upon a slotted support 33 projecting upward from the bell. The weight 30 is so positioned that, when the bell falls to a predetermined level, the weight descends upon the lever 17 or the weight 19 thereon. Thus, greater weight is imposed upon the diaphragm 15, and the latter can not be raised sufficiently to stop the motor 5 until after the pressure in the generator has been augmented to such degree as to open the valve 28 and replenish the gasometer. The height at which the gasometer bell affects the pressure control mechanism of the generator may be varied by bending the lever 31 or by any other suitable adjustment. It will be seen that the weight 30 is adapted to continue to rest merely with the force of gravity even though the bell of the gasometer fall some distance below the predetermined level, the lever 31 merely lifting out of the support 33. However, if desired, the lever 17 may be held down positively by the descent of the gasometer bell. Should the bell of the gasometer rise too high, a pipe 34, closed at its upper end and provided with lateral perforations, is lifted with its perforations above the water level; so that the excess gas escapes into the pipe 34, and thence into the pipe 35, to the blow-off pipe 36.

Details that do not pertain to the present invention but which may be mentioned are a pipe 37 with manual valve that may connect the gas chamber of the generator with the blow-off pipe 36, provision whereby the gasometer may be supplied direct past a manually-operated valve 38, and a pipe 39 with manual valve that serves to drain the flash-back chamber 12.

In operation, gas under pressure can be

taken directly from the generator for use in welding, and gas under little more than atmospheric pressure can be taken from the gasometer for compressing or lighting. When sufficient acetylene has been taken from the gasometer, the fall of the bell causes added weight to be imposed on the diaphragm 15, whereby feeding of carbid and consequent evolution of gas continue until the pressure is sufficient to open the valve 28, when acetylene passes over to the gasometer. The bell of the latter now rises, removing the added weight from the diaphragm 15, whereupon the diaphragm immediately rises, stopping the motor and arresting the formation of gas; the motor remaining stationary until the pressure in the generator falls below the degree for which the diaphragm is set. Thus, a continuous supply of gas under practically constant pressure may be taken direct from the generator, and at the same time or different time gas for lighting or compressing may be taken from the gasometer. At any time when the gasometer bell has not descended to render the diaphragm 15 inoperative to stop the motor at the pressure for which the diaphragm is set, should an excess pressure, equal to or greater than the pressure for which the valve 28 is set, exist in the generator, the valve 28 would act as a relief valve to permit the excess to pass over to the gasometer.

A feature of practical value, which is, however, not novel in this case, but which may be mentioned, is the provision that when the pressure in the generator approaches closely to atmospheric the motor 5 is again stopped. By reference to Fig. 1 it will be seen that, under such circumstances, with the diaphragm 15 unsustained by pressure from beneath, the stop 7 is shifted sufficiently to cause it again to contact with the fan 8, *i. e.*, below the notch therein, thereby stopping the motor. Thus, should the acetylene be escaping from the generator into the open air, with consequent fall of pressure to atmospheric, waste of carbid and dangerous evolution of gas by continued feeding is avoided.

What I claim as new is:

1. Acetylene generating apparatus, comprising, a pressure generator, having feed mechanism and pressure control mechanism therefor adapted to be set for a predetermined pressure, a gasometer, gas connection between the generator and gasometer including a pressure-operated valve adapted to be set for a higher generator pressure, and means adapted to be actuated by said gasometer to maintain the generator feed mechanism in operation when the gas in the gasometer is less than a predetermined volume.

2. Acetylene generating apparatus, comprising, a pressure generator, having feed

mechanism and pressure control mechanism operatively associated with said feed mechanism and adapted to be set for a predetermined pressure above and below which it stops and starts the feed mechanism respectively; a gasometer, gas connection between the generator and gasometer including a pressure-operated valve adapted to be set for a higher generator pressure, and a member operatively associated with said pressure control mechanism and adapted to be actuated by said gasometer when the gas therein is less than a predetermined volume to render said pressure control mechanism inoperative to stop said feed mechanism at a pressure above that for which said control mechanism is set but lower than that at which said valve opens.

3. Acetylene generating apparatus, comprising, a pressure generator, having carbide feed mechanism including a motor, and a pressure diaphragm operatively associated with said motor and adapted to be set for a predetermined pressure above and below which said motor is stopped and started respectively, a gasometer including a bell, gas connection between said gasometer and generator including a pressure controlled valve adapted to be set for a higher generator pressure, and a weight moved by the gasometer bell and adapted to be imposed upon said diaphragm in opposition to the

generator pressure when said bell is below a predetermined level, said weight being adapted to make up the difference between the pressures for which said diaphragm and valve are set.

4. Acetylene generating apparatus, comprising, a pressure generator, having carbide feed mechanism including a motor, and a pressure diaphragm operatively associated with said motor and adapted to be set for a predetermined pressure above and below which said motor is stopped and started respectively, a gasometer including a bell, gas connection between said gasometer and generator including a pressure controlled valve adapted to be set for a higher generator pressure, a weight moved by the gasometer bell and adapted to be imposed upon said diaphragm in opposition to the generator pressure when said bell is below a predetermined level, said weight being adapted to make up the difference between the pressures for which said diaphragm and valve are set, and blow-off mechanism forming a part of said gasometer and adapted to become operative when said bell rises to a predetermined level.

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Witnesses:

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W. K. NOXON.