No. 757,289. PATENTED APR. 12, 1904.

R. L. EVERETT.

POWER GENERATING APPARATUS.

APPLICATION FILED MAR. 31, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

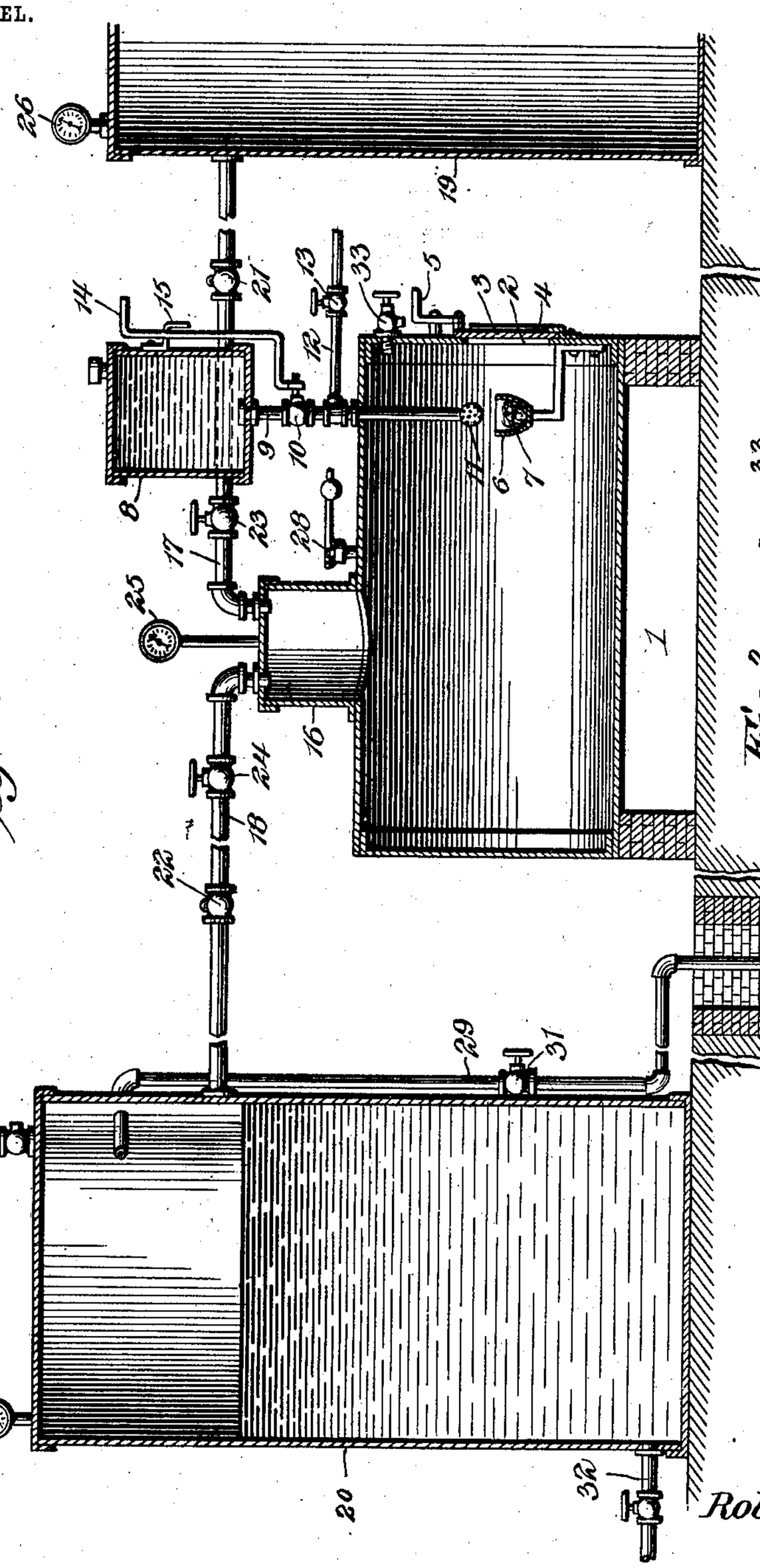
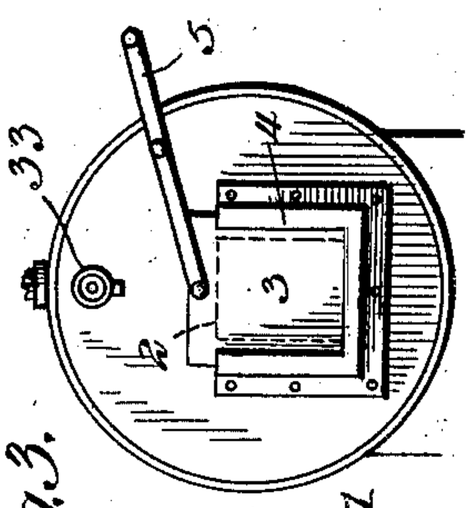


Fig. 3.



Witnesses
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Louis G. Julihn

Robert L. Everett,
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By E. G. Siggers.
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NO MODEL. 2 SHEETS—SHEET 2.

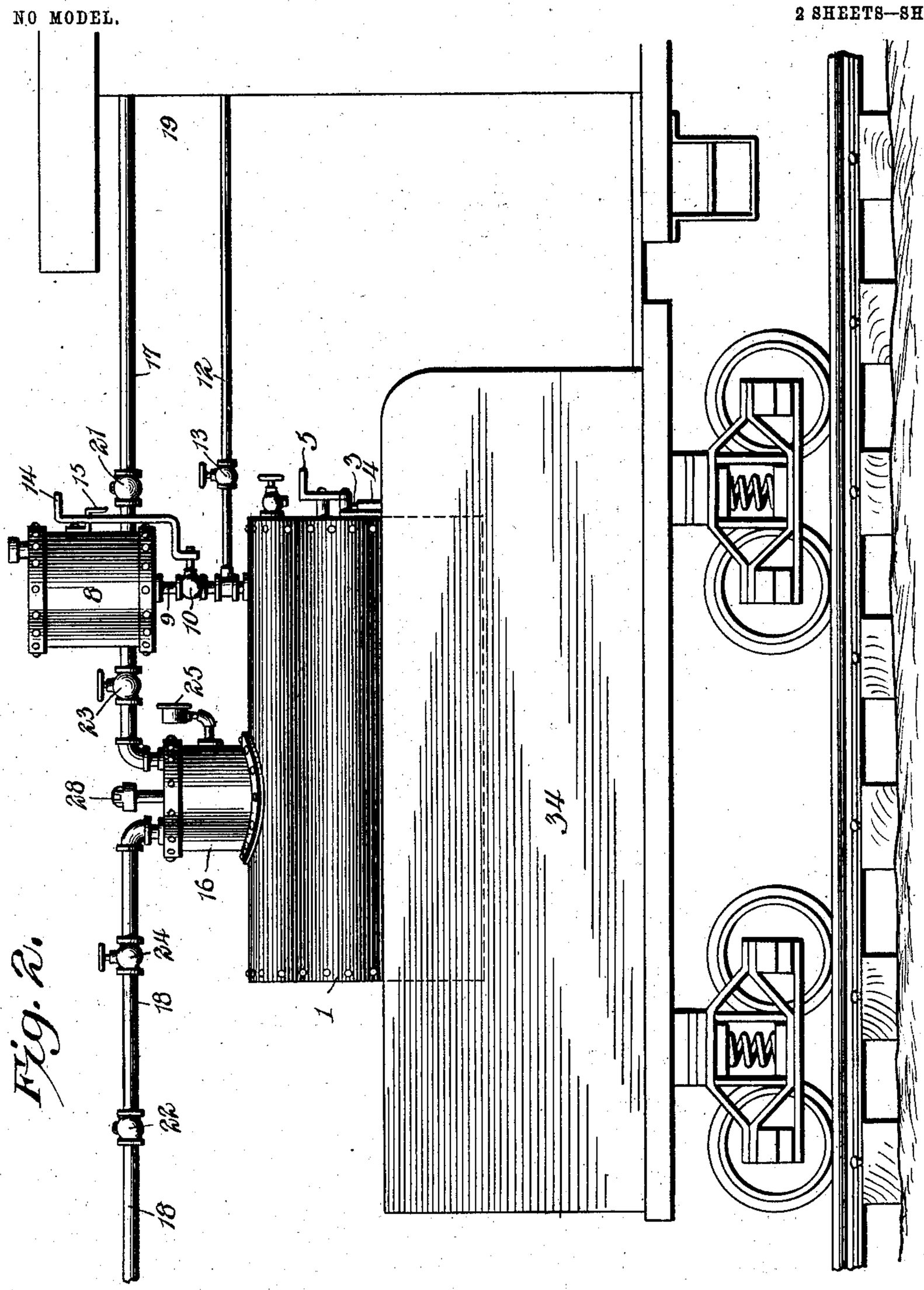

Fig. 2.

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No. 757,289. Patented April 12, 1904.

UNITED STATES PATENT OFFICE.

ROBERT L. EVERETT, OF SCOTTSBLUFF, NEBRASKA.

POWER-GENERATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 757,289, dated April 12, 1904.

Application filed March 31, 1902. Serial No. 100,852. (No model.)

To all whom it may concern:

Be it known that I, ROBERT L. EVERETT, a citizen of the United States, residing at Scottsbluff, in the county of Scotts Bluff and State of Nebraska, have invented a new and useful Power-Generating Apparatus, of which the following is a specification.

This invention relates to a novel power-generating apparatus, and has for its object to utilize the same instrumentality for simultaneously compressing a fluid in one chamber and creating a partial vacuum in another, so that the expansive action of the compressed fluid and the suction induced by the vacuum may be converted, either simultaneously or alternately, into kinetic power.

Considered somewhat more specifically, the object of the invention is to utilize the force of an explosion to store a compressed fluid in a suitable receiver or compression-chamber and to exhaust the air from a vacuum-chamber, the potential energy thus created being designed for conversion wherever the agency of a compressed fluid or of a vacuum is available.

Subordinate to this general object are others which will more fully appear hereinafter as I proceed with the description of that embodiment of the invention which for the purposes of the present application I have illustrated in the accompanying drawings and succinctly claimed.

In said drawings, Figure 1 is a sectional view of my apparatus complete, together with certain adjunctive structures; and Fig. 2 is a side elevation showing the application of my device to a locomotive-tender. Fig. 3 is an end view of the explosion-chamber.

Like numerals of reference are employed to designate corresponding parts throughout the views.

The initial power unit in the present embodiment of the invention is in the form of an explosion-chamber 1, which is a metal cylindrical chamber capable of withstanding an enormous pressure and provided at one end with an opening or doorway 2, normally closed by a close-fitting sliding door 3, movable within the guides 4 and operated by a suitable handle or lever 5.

Within the explosion-chamber adjacent to the opening or doorway 2 is provided an igniter 6, any of the well-known forms of which may be employed. In the present instance I have shown a cup-shaped receptacle, in the bottom of which is designed to be deposited a torch 7, which after the door 3 has been closed will explode a charge projected into the receptacle from a charge-chamber 8, preferably located upon the exterior of the explosion-chamber 1. The charge-chamber 8 is preferably in the form of a tank, as shown, for the reception of gasolene or other explosive fluid and is provided with a discharge-pipe 9, controlled by a charging-valve 10. The pipe 9 extends downwardly through the upper wall of the explosion-chamber and at a point immediately above the igniter is formed with a spray-nozzle 11, the force of the spray being preferably augmented by the introduction into the discharge-pipe 9 of compressed air received from any suitable source and conveyed to a discharge-pipe through a laterally-disposed air-pipe 12, communicating with the discharge-pipe between the explosion-chamber and the valve 10 and controlled by an air-cock 13. The charging-valve 10 in the pipe 9 is operated by a valve-lever 14, extended upwardly alongside of the charge-chamber or fluid-reservoir 8 and secured by a catch 15, which insures the normal retention of the valve 10 in its closed position.

At its upper side the explosion-chamber is provided with a dome 16′, communicating, through lead-pipes 17 and 18, with a pressure-storage chamber 19 and a vacuum-chamber 20, said chambers constituting the positive and negative storage units of the apparatus. If desired, a plurality of pipes may extend to each chamber, or the number of chambers may be increased. When an explosion takes place within the explosion-chamber 1, it is designed that compressed air and gases will be discharged into the pressure-storage chamber 19 with considerable force, and it is also intended that the partial vacuum created in the explosion-chamber 1 will induce the indrawing of air from the vacuum-chamber 20, thus creating a vacuum in the latter. It is essential, therefore, that provision be made for preventing the gases from the explosion-chamber 1 from passing through the pipe 18 to the vacu-

um-chamber or the escape of such gases from the storage-chamber back to the explosion-chamber through the pipe 17. I therefore provide the pipes 17 and 18 with oppositely-opening check-valves 21 and 22, the former permitting the passage of gases from the explosion-chamber to the pressure-storage chamber, but resisting back pressure, and the valve 22 permitting the passage of air from the vacuum-chamber to the explosion-chamber, but automatically preventing the entrance of the gases to the vacuum-chamber. In addition to the check-valves the lead-pipes are provided between the check-valves and the dome 16 with controlling-valves 23 and 24, by means of which either the storage-chamber or the vacuum-chamber may be disconnected from the explosion-chamber whenever it is desired to utilize the latter for either the storage of compressed gases or the formation of a vacuum alone. The chambers 16, 19, and 20 are preferably equipped, as shown, with pressure-gages 25, 26, and 27, and the explosion-chamber is provided with a blow-off or safety-valve 28.

In its broad aspect the invention contemplates merely the arrangement of the explosion-chamber, the pressure-storage chamber, and the vacuum-chamber in such relation that a single explosion will effect the compression of air in one chamber and the formation of a vacuum in another chamber. In Fig. 1 of the drawings, however, I have illustrated one way in which the negative pressure in the vacuum-chamber may be utilized. A stand-pipe 29, leading from a well 30 and provided with a check-valve 31, has its upper or discharge end located within the vacuum-chamber 20 at a point above the connection of the lead-pipe 18, and the bottom of the vacuum-chamber is provided with a valve-controlled outlet 32, through which water within the chamber 20 may be drawn off. It will now be evident that when the vacuum is formed in the vacuum-chamber by the rush of air from said chamber to the explosion-chamber water will be drawn through the stand-pipe 29 and will be discharged in the vacuum-chamber, the flow of water continuing until the negative pressure is materially reduced by the accumulation of water in the chamber. In practice the normal water-line within the vacuum-chamber will be just below the connection of the pipe 18, the outflow of water being so proportioned to the inflow that the water will be prevented from flowing into the pipe 18. It will be evident, however, that as the upper end of the stand-pipe 29 is also located above the level of the water in the chamber 20 the vacuum produced in the upper end of the chamber will always be effective to elevate the water from the well.

The operation of that form of apparatus illustrated in Fig. 1 is as follows: The valves 23 and 24 being open, the torch 7 of the igniter is lighted and the door 3 is moved to its closed position. The valve 13 of the air-pipe 12 is opened to admit air to the discharge-pipe 9, and the valve-lever 14 is manipulated to effect the opening of the charging-valve 10. Upon the opening of this valve a charge of explosive fluid—as, for instance, gasolene—will escape through the pipe 9 and will be sprayed from the jet-nozzle 11 at the lower end thereof, it being obvious that the valve 10 will be opened and closed in rapid succession. A violent explosion will now take place in the explosion-chamber 1, driving the air and gases from said chamber to the pressure-storage chamber 19, the check-valve 21 resisting back pressure of the gases after they have passed this point in the lead-pipe 17. The discharge of the air and gases from the explosion-chamber 1 will create a partial vacuum in the latter, and this will be immediately supplied by the indrawing of air from the vacuum-chamber 20, wherein a partial vacuum will be created. The door 3 may now be opened to admit a further air-supply to the explosion-chamber 1, or an air-cock 33 may be utilized for this purpose. The restoration of atmospheric pressure within the explosion-chamber 1 will not affect the partial vacuum created in the chamber 20 by reason of the presence of the check-valve 22 in the pipe 18, and it is evident that the torch having again been lighted and the door 3 closed the operation just described will be repeated to increase the compression in the chamber 19 and to create a more complete vacuum in the vacuum-chamber 20. If, as shown in Fig. 1, the stand-pipe 29 is in communication with the upper end of the vacuum-chamber, the suction induced by the vacuum will cause the elevation of water from the well and its discharge into the vacuum-chamber, from whence it may be delivered through the outlet 32.

In Fig. 2 of the drawings I have shown the explosion-chamber 1 mounted upon the tender 34 of a locomotive. (Not illustrated.) This figure is intended particularly to illustrate one of the many uses to which my apparatus may be put. With the explosion-chamber mounted upon the locomotive-tender in the manner shown the pipe 17 could be led directly to the locomotive-boiler without necessity for any considerable change in the locomotive construction now in use. In this event the compressed gases stored within the locomotive-boiler or pressure-storage chamber would be utilized as the motive agent instead of steam. In like manner the pipe 18 could be led to the vacuum brake system of the train or to the vacuum signal system thereof.

From the foregoing it will appear that I have produced a novel apparatus for simultaneously generating positive and negative power through the operation of a single power unit; but while the present embodiment of

the invention is thought at this time to be preferable I do not wish to be understood as limiting myself to the structural details defined, as, on the contrary, I distinctly reserve the right to effect such changes, modifications, and variations thereof as may be embraced within the scope of the protection prayed.

What I claim is—

1. In an apparatus of the character described, the combination with a pressure-storage chamber and a vacuum-chamber, of an explosion-chamber in communication therewith, check-valves controlling the communication between the explosion-chamber and each of the other chambers, means for supplying an explosive mixture to the explosion-chamber, and an igniting device for exploding the charge within the explosion-chamber to deliver gases to the storage-chamber and create a partial vacuum in the vacuum-chamber.

2. In an apparatus of the character described, the combination with a pressure-storage chamber, and a vacuum-chamber of an explosion-chamber, pipes establishing communication between the explosion-chamber and each of the other chambers, a check-valve and a controlling-valve in each of said pipes, means for supplying an explosive mixture to the explosion-chamber, and an igniting device for exploding the charge within the explosion-chamber to deliver gases to the storage-chamber and to create a partial vacuum in the vacuum-chamber.

3. In an apparatus of the character described, the combination with a pressure-storage chamber and a vacuum-chamber, the latter having means for permitting the ingress and egress of water, of an explosion-chamber communicating with the vacuum-chamber above the water-level and also communicating with the compression-chamber, check-valves controlling the communication between the explosion-chamber and each of the other chambers, means for supplying an explosive mixture to the explosion-chamber, and an ignition device for exploding the charge within the explosion-chamber to deliver gases to the storage-chamber and to create a partial vacuum in the vacuum-chamber above the water-level.

4. In an apparatus of the character described, the combination with a pressure-storage chamber and a vacuum-chamber, of an explosion-chamber in communication therewith, oppositely-opening valves controlling the communication between the explosion-chamber and each of the other chambers, a charge-chamber exterior to the combustion-chamber, a torch-receptacle upon the interior of said combustion-chamber, a spray-nozzle discharging into the torch and in communication with the charge-chamber, and an air-pipe communicating with the nozzle.

5. In an apparatus of the character described, the combination with a pressure-storage chamber, and a vacuum-chamber, of an explosion-chamber in communication therewith, oppositely-opening valves controlling the communication between the explosion-chamber and each of the other chambers, means independent of the vacuum-chamber for supplying an explosive mixture to the explosion-chamber, and an igniting device for exploding the charge within the explosion-chamber to deliver gases to the storage-chamber and create a partial vacuum in the vacuum-chamber.

6. In an apparatus of the character described, the combination with a pressure-storage chamber, and a vacuum-chamber, of an explosion-chamber in communication therewith, oppositely-opening valves controlling the communication between the explosion-chamber and each of the other chambers, means independent of the vacuum-chamber for supplying an explosive mixture to the explosion-chamber, an ignition device for exploding the charge within the explosion-chamber to deliver gases to the storage-chamber and to create a partial vacuum in the vacuum-chamber, a stand-pipe opening into the vacuum-chamber, and an outlet preventing the water or other fluid drawn into the vacuum-chamber from escaping to the explosion-chamber.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ROBERT L. EVERETT.

Witnesses:
WM. H. WRIGHT,
ARTHUR L. BROOKS.