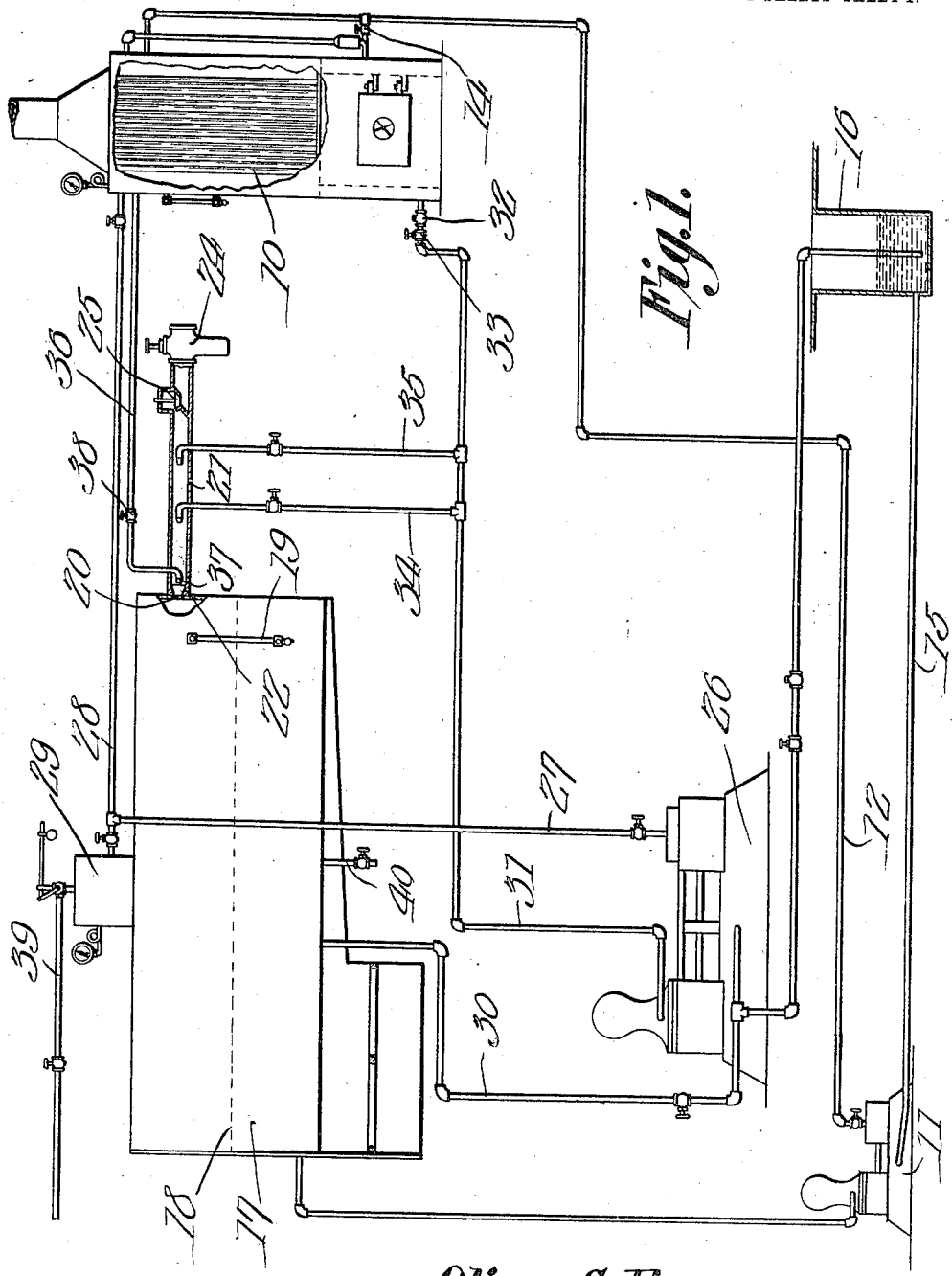
O. S. EMERSON.

AIR ACCUMULATOR.

APPLICATION FILED JULY 9, 1912.

1,068,579. Patented July 29, 1913.

2 SHEETS—SHEET 1.



Witnesses

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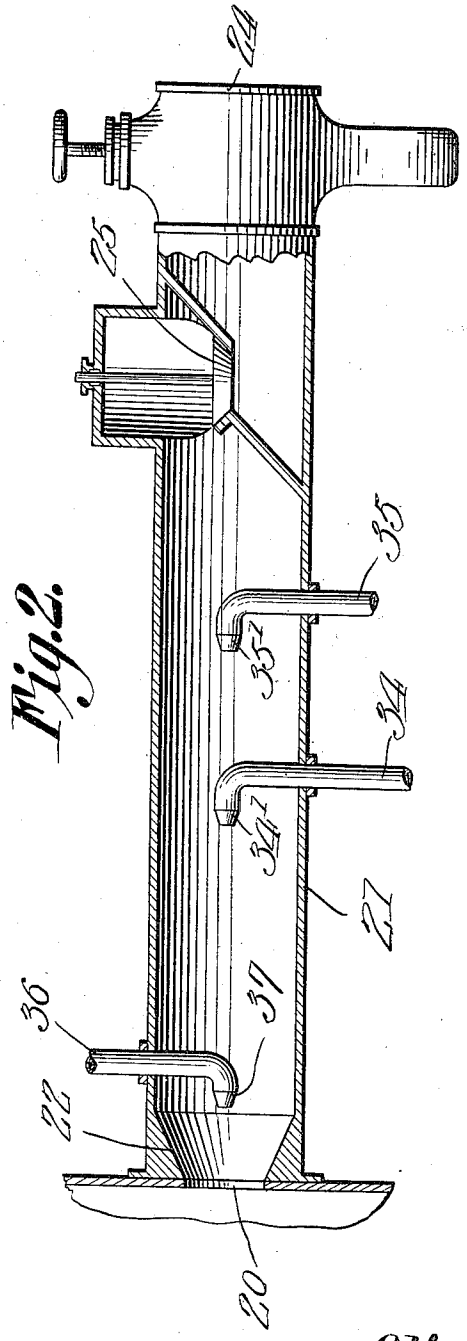

Fig. 2.

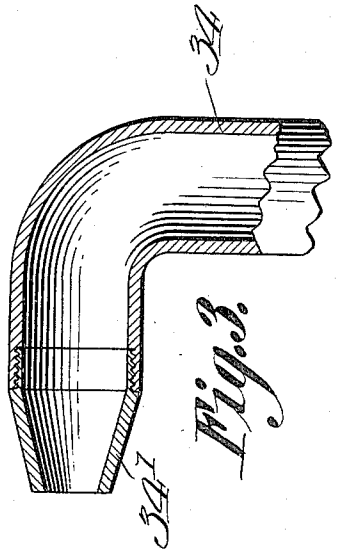

Fig. 3.

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UNITED STATES PATENT OFFICE.

OLIVER S. EMERSON, OF LUXORA, ARKANSAS.

AIR-ACCUMULATOR.

1,068,579. Specification of Letters Patent. Patented July 29, 1913.

Application filed July 9, 1912. Serial No. 708,517.

To all whom it may concern:

Be it known that I, OLIVER S. EMERSON, a citizen of the United States, residing at Luxora, in the county of Mississippi and State of Arkansas, have invented a new and useful Air-Accumulator, of which the following is a specification.

This invention relates to an improvement in air accumulators.

The primary object of the invention is to provide means for accumulating air by water pressure.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings—Figure 1 is a diagrammatic view. Fig. 2 is a sectional view of the injector casing. Fig. 3 is a detailed sectional view of one of the water injecting nozzles.

In the drawings, 10 designates the steam generator which may be of any appropriate construction. The pump 11 receives steam from said generator through the conduit 12, the supply of steam being controlled by the valve 14. This pump is connected by the pipe 15 with the water supply tank 16, the same when actuated drawing water from said tank and supplying the same to the tank 17. The normal water line in this tank is indicated at 18, there being a gage 19 to indicate the amount of water within said tank.

The present invention contemplates the use of water under pressure which at times is assisted by an auxiliary steam jet, for causing air to be supplied under pressure to the tank 17. The tank is formed with an inlet 20 which communicates with what may be termed the injector casing 21, the casing adjacent the tank being formed with the tapered restricted opening 22. This casing communicates at its terminal remote from the tank with a valved air inlet 24, a spring check valve 25 being disposed adjacent said inlet, the valve allowing air to enter the injector casing and the tank.

To create the desired suction in the injector casing, that is the suction necessary to open the valve 25 and cause air to be sucked within the boiler 17, a pump 26 is provided. The engine 26′ of the pump receives steam through the pipes 27 and 28 from the generator 10, the pipe 27 communicating with the pipe 28 which is connected with the dome 29. The pump 26 is connected by the pipe 30 with the tank 17, the pump forcing the water under pressure through the pipe 31. This pipe is connected to the generator 10, there being a check valve 32 arranged within the same adjacent the generator, said valve allowing water to pass from the generator, the valve 33 being arranged in said pipe to govern the supply. The pipe 31 between the generator and the pump is connected to a plurality of pipes 34 and 35 which extend within the injector casing 21, said pipes terminating in nozzles 34′ 35′, respectively, which extend in the direction of the tank. These nozzles supply water under great pressure to the tank 17, the suction created in the injector casing 21 opening the valve 25, sucking air through the injector casing to the tank, thus supplying air under pressure to the tank.

When the pressure in the tank becomes excessive to have a tendency to retard the inrushing air, steam is injected in the injector casing adjacent the opening 20. This steam is supplied by the pipe 36, the nozzle 37 of said pipe being arranged in the injector casing adjacent the opening 21, the supply of steam being regulated by the valve 38. Thus the constant pressure of air is maintained within the tank 17, the accumulated air being used in any desired manner, being conducted from the tank through the pipe 39.

It will be noted that the generator serves to supply water first to the tank 17 which is the working reservoir, then withdrawing the water supplied and returning the same to the tank under pressure to compress air in the same, there being a constant supply of water to the tank and a constant circulation of the water which is fed through the same, the outlet 40 being provided to drain the water from the tank. The desired water level is maintained in the tank, by the proper timing of the pump and in order that the same will not entirely fill the tank 17. It will also be noted that the entire construc-

tion is such that the same may be easily and economically manufactured and that the various parts may be readily assembled.

What is claimed is:

1. In an air accumulator, the combination with a steam generator, a tank, a pump actuated by the steam generator to supply water to the said tank, and a steam actuated pump for withdrawing water from said tank and reconducting the same to said tank to force air under pressure therein, of a conduit in communication at one end of the tank, said conduit at the end remote from the tank being provided with a valve controlled air inlet port, a check valve disposed in said conduit to retain the pressure therewithin beyond the air inlet port, a steam projecting nozzle disposed within said conduit and adjacent the tank, and a plurality of water injecting nozzles disposed within the conduit intermediate of the steam injecting nozzle and the check valve.

2. In an air accumulator, the combination with a steam generator, a tank, a pump actuated by the steam generator to supply water to the said tank, a steam actuated pump for withdrawing water from said tank and reconducting the same to said tank to force air under pressure therein, and means for supplying steam to the tank at the point where the water is supplied under pressure, of a conduit in communication at one end of the tank, said conduit at the end remote from the tank being provided with a valve controlled air inlet port, a check valve disposed in said conduit to retain the pressure therewithin beyond the air inlet port, a steam projecting nozzle disposed within said conduit and adjacent the tank, and a plurality of water injecting nozzles disposed within the conduit intermediate of the steam injecting nozzle and the check valve.

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

OLIVER S. EMERSON.

Witnesses:
R. N. FARBER,
J. M. MAJORS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."