No. 847,727. PATENTED MAR. 19, 1907.

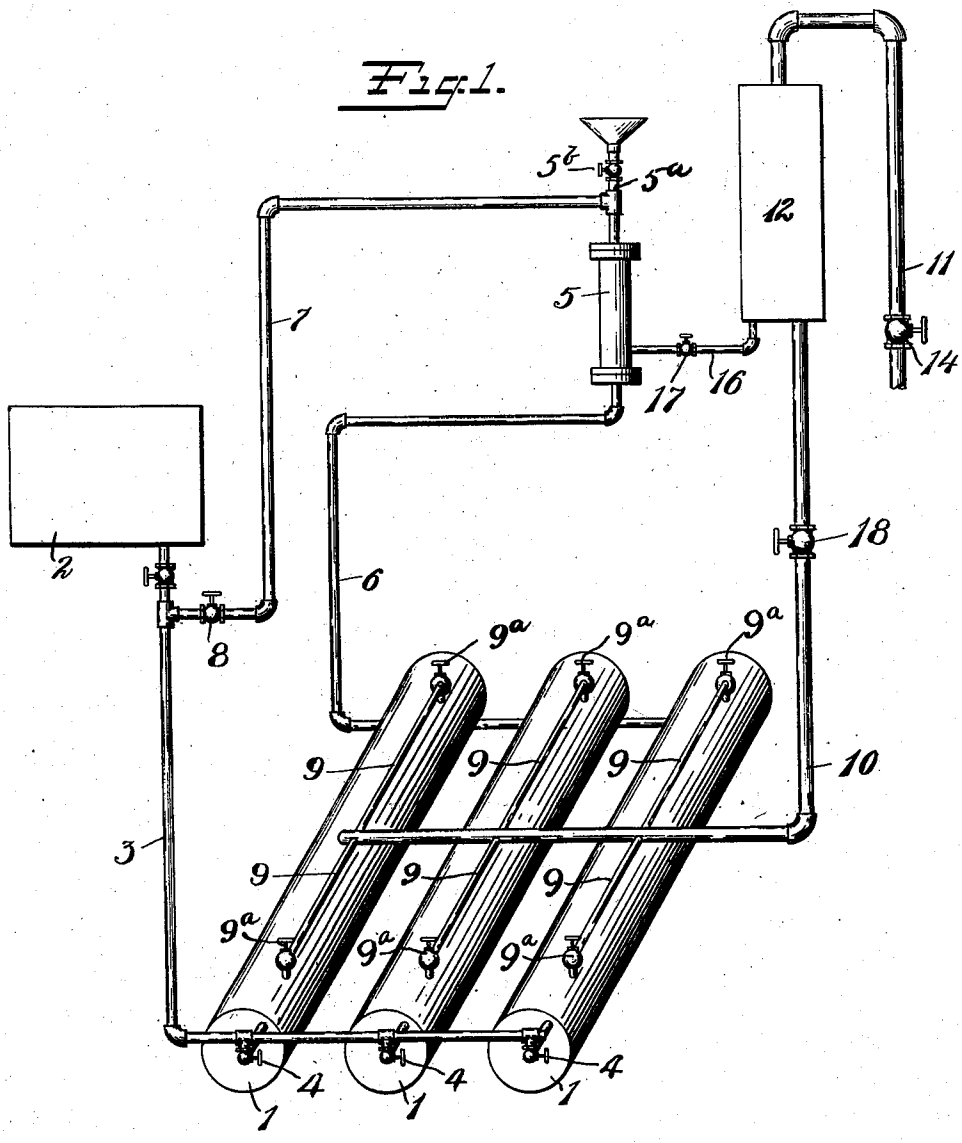
R. E. BRUCKNER.

METHOD OF CHARGING GAS TANKS.

APPLICATION FILED OCT. 31, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

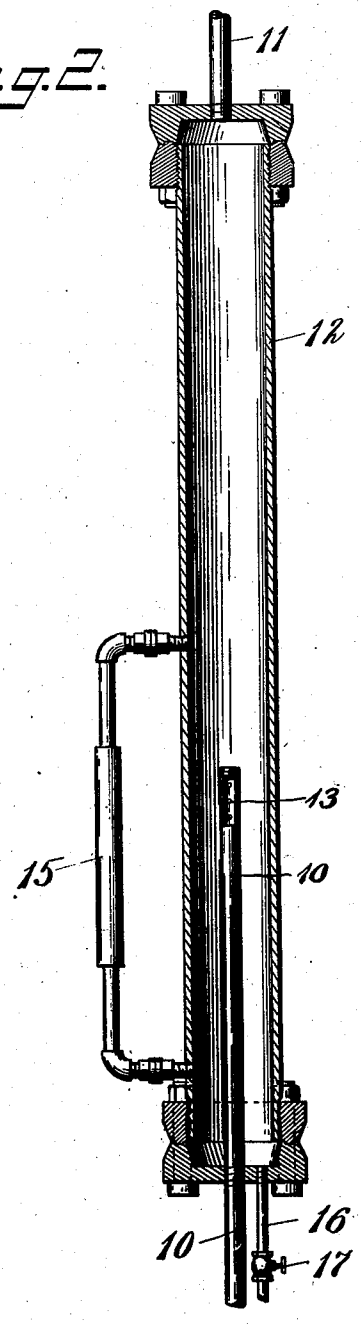
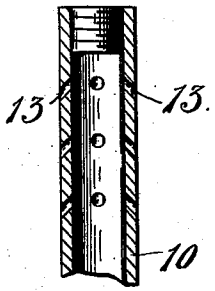


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

RUDOLPH E. BRUCKNER, OF MOUNT VERNON, NEW YORK, ASSIGNOR TO THE COMMERCIAL ACETYLENE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

METHOD OF CHARGING GAS-TANKS.

No. 847,727. Specification of Letters Patent. Patented March 19, 1907.

Application filed October 31, 1906. Serial No. 341,392.

To all whom it may concern:

Be it known that I, RUDOLPH E. BRUCKNER, a citizen of the United States, residing at Mount Vernon, Westchester county, New York, have invented certain new and useful Improvements in Methods of Charging Gas-Tanks, of which the following is a full, clear, and exact description.

My invention relates to the storage of acetylene gas and the charging of portable tanks. By "portable tanks" I mean tanks such as are filled in one locality and transported to be used in some other locality—such, for instance, as tanks used on automobiles and railway-cars, which are charged at a central station.

It is customary to store acetylene gas under pressure in a tank or tanks containing a more or less porous substance together with a quantity of a liquid absorbent, such as acetone. It is not generally feasible to compress the gas directly into the portable tanks from the gas-generator; so I have devised a system and apparatus for temporarily storing the gas so that the portable tanks may be filled at any time from the holding-reservoir. For this purpose the principal storage-tank, which may conveniently be termed a "holding-reservoir," is constructed similarly to the portable tanks, preferably of larger capacity, so that sufficient gas may be stored in the holding-reservoir for charging a number of portable tanks. The holding-reservoir is supplied with acetone or an equivalent and is charged with gas under pressure by means of a suitable compressor or pump. The charge in the portable tanks should contain only a certain proportion of the liquid absorbent—for instance, acetone. If this proportion of acetone is too great, there is danger of the excess being carried over into the low-pressure line of the lighting system leading from the tank, resulting in an obstruction of the pipes, flickering, and sometimes extinction of the light or lights. When the tanks are properly charged, there is no danger from this source. The normal pressure in the holding-reservoir is preferably about one hundred and fifty pounds per square inch, and the pressure in the portable tanks is maintained about the same. It will be understood, of course, that the pressure is reduced between the portable tank and the burners in the lighting system by a suitable device. After use the pressure in the portable tanks will of course be reduced. In recharging it has been found that the sudden rush of gas in charging the tank by the old methods causes such a rapid flow from the storage system that the liquid absorbent in the storage-reservoir is entrained with the gas and rushes through the charging-lines into the portable tank, thus causing an excess of the liquid in the latter. To avoid this difficulty, I have devised a method and means for removing any excess liquid absorbent from the gas at a point intermediate the storage-reservoir and the pressure-tank which is being charged. The system also provides for the return of this excess liquid to the storage-reservoir, thereby avoiding all loss of acetone, while at the same time guaranteeing a proper charging of the portable tanks.

Figure 1 is a diagrammatic view of a system and apparatus embodying the improvements of my invention. Fig. 2 is a vertical sectional view of means for removing the liquid absorbent from the gas after it leaves the storage-reservoir. Fig. 3 is an enlarged fragmentary detail of a part of the apparatus shown in Fig. 2.

The storage-reservoir consists of one or more tanks, such as 1, and is supplied when necessary with gas under pressure from a suitable generating system and compressor, (conventionally indicated at 2.) The supply-pipe 3 leads to a point near the top of each of the storage-tanks, and the valve 4 is provided for each branch of said pipe for cutting off the supply to any particular tank. A liquid absorbent, such as acetone, is supplied to each tank 1 from the reservoir 5, which latter is connected by a pipe 6 to each tank 1, preferably near the bottom. The reservoir 5 may be supplied with acetone whenever required through pipe 5^a, provided with valve 5^b. Suitable valves (not shown) may be provided for controlling the supply of acetone to tanks 1 1. A branch pipe 7, leading from the compressor to the acetone-reservoir, may be provided to supply pressure in the acetone-reservoir to force the acetone into the storage-tanks 1. This branch, as required, has a valve 8.

From each end of each storage-tank a pipe

9 leads toward the center, where it is connected to a main pipe 10, valves 9^a 9^a being provided for pipes 9 9.

Between the main 10 and the pipe 11, from which the portable tanks (not shown) are charged, is located apparatus for removing any excess of the liquid absorbent that may have been entrained with the gas by reason of the action before referred to. This apparatus consists of a case 12, Fig. 2, up into which projects the discharge end of pipe 10 and from the upper end of which extends the charging-pipe 11 for the portable tanks. The upper end of the main 10 is closed or hooded, and a plurality of side outlets, such as 13 13, are provided, which are preferably inclined downwardly, as shown in Fig. 3. When an abnormal reduction in pressure occurs within the chamber 12 by reason of the opening of the outlet-valve 14 in pipe 11 for the purpose of charging a portable tank, gas from the storage-reservoir rushes through the main 10 and passes through the orifices 13 13 into the case 12. In case any of the liquid has been entrained with the gas it will be released upon this sudden expansion and delivery into the case 12 and will fall into the bottom of the latter. The quantity of liquid in the case 12 can be readily determined at any time, for instance, by means of a sight-glass 15, connected to the chamber. When any considerable quantity is collected, it may be drawn off and conveyed back to the acetone-reservoir 5 through the pipe 16, a valve 17 therein being opened for this purpose.

It will be obvious that flexible or expanding connections may be provided in the pipelines at any point where it may be desirable or necessary to compensate for expansion and other movements of the parts of the system. The form and arrangements of the storage-reservoir and the number of tanks employed is immaterial; but the reservoir should preferably be of such size as to make it unnecessary to recharge it from the generator more than, say, once a day.

What I claim is—

1. In a gas storing and charging system, the method of charging portable tanks with gas consisting first in storing under pressure a reservoir with gas and a liquid absorbent, then transferring the gas under pressure to a portable tank, and abstracting the liquid absorbent contained in said gas during the transit of the same from said reservoir to said tank so that only substantially dry gas will be contained in the latter.

2. In a gas storing and charging system, the method of charging a tank with gas from a storage-reservoir consisting first in charging under pressure the reservoir with gas and a liquid absorbent, then conveying the same under pressure to a separating device, there abstracting from the gas any absorbent that is in a liquid state and conveying under pressure the gas thus obtained to the portable tank and returning the liquid absorbent thus extracted to the storage-reservoir.

RUDOLPH E. BRUCKNER.

Witnesses:
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