(No Model.)

J. M. BRUCE.

TANK FOR THE RECEPTION AND TRANSPORTATION OF NATURAL GAS.

No. 308,948. Patented Dec. 9, 1884.

Fig. 1.

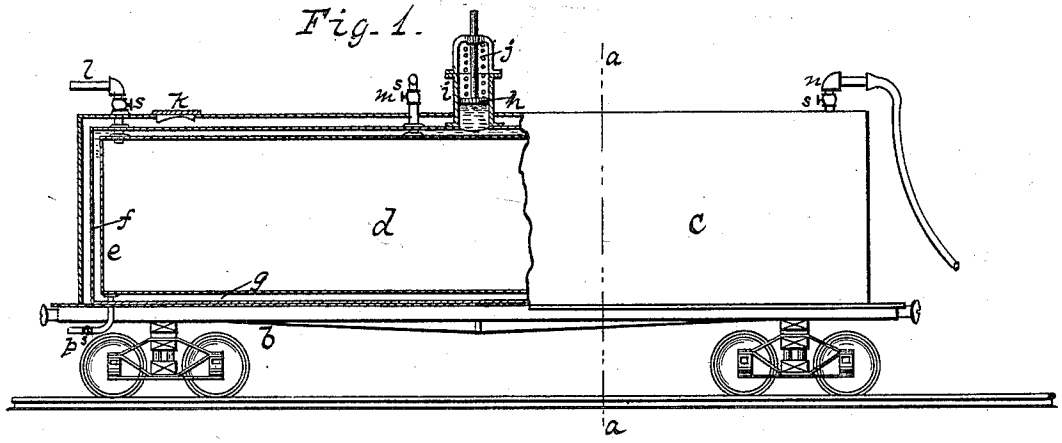
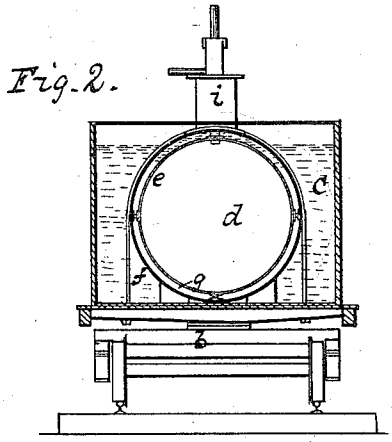


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN M. BRUCE, OF PITTSBURG, PENNSYLVANIA.

TANK FOR THE RECEPTION AND TRANSPORTATION OF NATURAL GAS.

SPECIFICATION forming part of Letters Patent No. 308,948, dated December 9, 1884.

Application filed July 8, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. BRUCE, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Tanks for the Safe Reception, Transportation, and Distribution of Natural or Artificially-Made Gas, which invention will be readily understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 represents a side view partly in section of a railway-car provided with a close box having horizontally arranged therein a strong double-walled tank fitted with suitable inlet and outlet pipes, together with such other means and appliances as are considered useful and necessary for the purpose of receiving or discharging gas, also the reception, retention, and discharge of such water or other fluid as may be interposed between the walls of the tank or between its outside and the surrounding box; Fig. 2, a transverse vertical section of the same on the line *a a*.

The object of my invention is to receive in a close vessel natural or artificially-made gas under a state of great compression, and transport the same in bulk and deliver it, as required, into the furnace of a locomotive during transportation, or other places designed for its reception and combustion, as the case may require, whether such places be movable or stationary, distant or near. To this end I prepare a car, *b*, of suitable shape, strength, and dimensions, and erect thereon a strong and covered water-tight box, *c*, containing a large iron tank, *d*, constructed with double walls *e f*, separated the one from the other in such a manner as to leave a space, *g*, all around and between them, which space is filled with water or other suitable fluid, and kept therein under pressure by means of a piston, *h*, inclosed within a cylinder, *i*, forced down upon the water by a strong spiral spring, *j*, that serves to keep such fluid solidly packed and prevent any undue looseness and swash of the same. The space *g*, existing between the exterior of the tank *d*, or its outer shell and the box *c*, is also filled with water, which is introduced through a conveniently-large opening in the top of the box, that is closed by a detachable cover, *k*. By removing the piston *h* from the cylinder *i* the cavity between the walls of the tank may be easily reached and filled with water, when the piston and spring can be as easily replaced and made secure. Communicating with the interior of the tank *d* are four pipes, *l m n p*, or connections therefor, each provided with a suitable gas-tight cock or valve, *s*. Three of these pipes extend upward and outwardly from the top of the tank, while the fourth, *p*, is located at its bottom and near one end thereof.

The several parts having been constructed in the manner shown and described, and the space existing between the walls *e f* of the tank *d*, and also the box *c*, properly filled with fluid matter, the entire structure so prepared is to be taken to or in the vicinity of a gas-producing well or other source of supply, and the tank *d* then temporarily filled with water for the purpose of driving out and excluding all atmospheric air. A connection is then made with the interior of the tank and gas-well by means of suitable hose or piping, and the valves or cocks of such connection opened. Whereupon the gas escaping from the well will, by reason of its great pressure, quickly enter the tank, so that upon opening the small pipe *p* at or near its bottom the water will be rapidly driven out and its place occupied and filled with pure gas under a pressure equaling its initial flow from the well, which in some instances exceeds two hundred pounds per square inch. The outlet-valve, by which the water made its escape from the tank, and also the valve of that pipe through which the gas was received, should then be closed and the connections with the well disengaged, so that the car with its supply of tanked gas may be moved to such places as are necessary for making an attachment to and for the purpose of furnishing such gas either directly or indirectly to a locomotive, whether standing or in motion, or such other furnace or place of combustion distant from the well, as and when required.

It is obvious that the double walls of the tank, with intermediate compressed water-packing, the body of water around its exterior shell between it and the box, taken together, make the tank absolutely gas-tight and fire-proof, whether the pressure be much or little, while the manner or mode of filling the

tank by first charging it with water and then excluding the same by a force or pressure of gas enables me to obtain such gas free from any admixture with atmospheric air, and in such a condition as it escapes from the well, and transport the same with perfect safety to distant portions of the country for the generation of steam and various other purposes useful in the arts.

Having thus described my invention, I claim—

1. The combination, in an apparatus for the transportation of gas, of a double-walled tank for containing the gas, having a space to be filled with water under constant pressure, and a surrounding tank for containing water, substantially as and for the purposes specified.

2. The combination, with the double-walled oil-tank located in an outer tank, of the cylinder having a spring-actuated piston, whereby the water filling the space between the double walls is kept under constant pressure, substantially as specified.

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Witnesses:
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