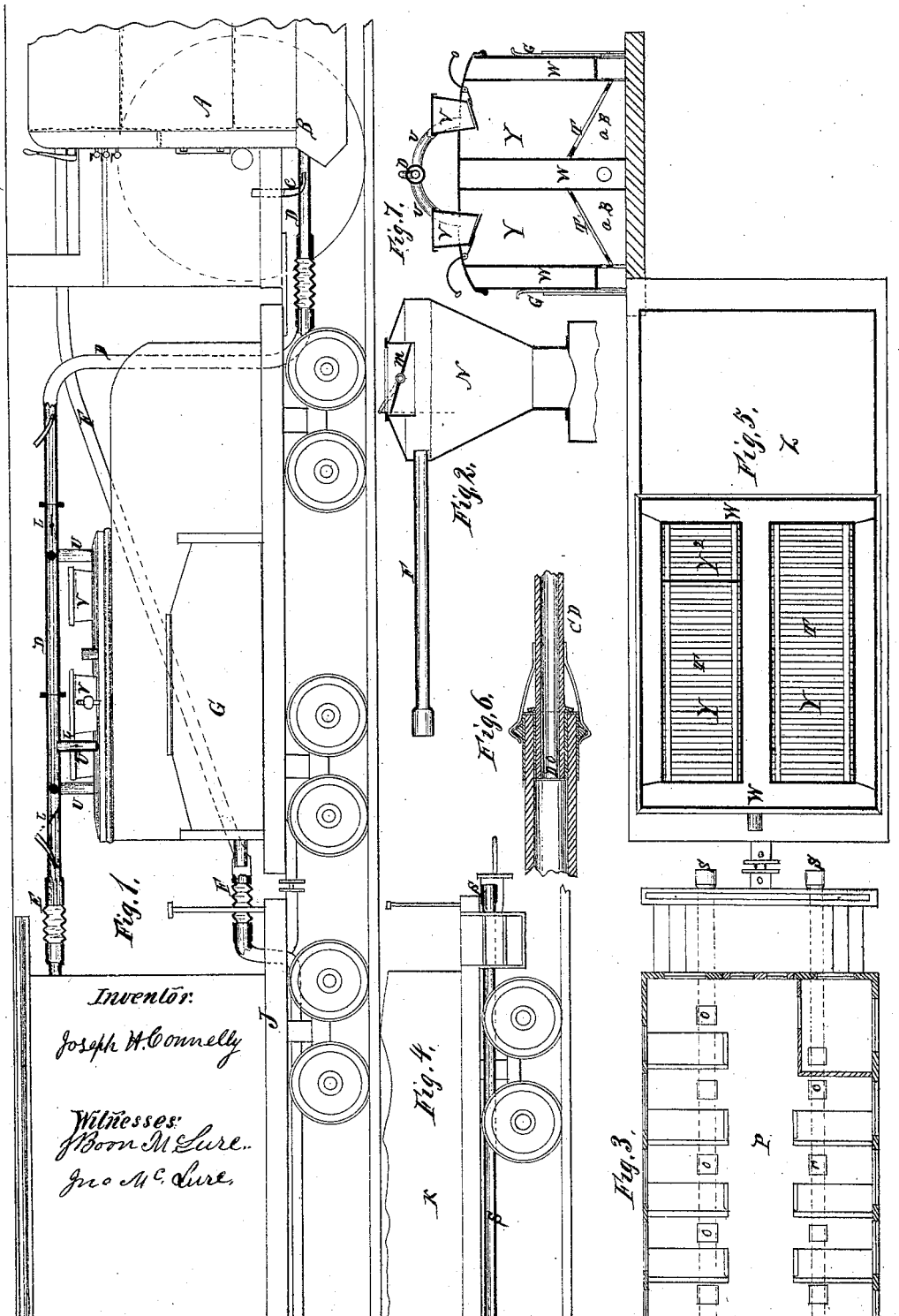


JOSEPH H. CONNELLY.

Improvement in Apparatus for Heating and Lighting
Locomotives and Railroad Cars by Gas.

No. 115,027.

Patented May 23, 1871.



UNITED STATES PATENT OFFICE.

JOSEPH H. CONNELLY, OF WHEELING, WEST VIRGINIA.

IMPROVEMENT IN APPARATUS FOR HEATING AND LIGHTING LOCOMOTIVES AND RAILROAD CARS BY GAS.

Specification forming part of Letters Patent No. 115,027, dated May 23, 1871.

To all whom it may concern:

Be it known that I, JOSEPH H. CONNELLY, of Wheeling, in the county of Ohio and the State of West Virginia, have invented certain Improvements in Gas-Producers, and the Manner of Preparing and Applying the Gas Generated therein to Heat Locomotive-Boilers and the Cars of Trains thereto attached, and also to Illuminate the latter, of which the following is a specification, reference being had to the accompanying drawing and the letters of reference marked thereon.

My invention relates, first, to the construction of a gas producer or retort, as hereinafter described, for generating a composition gas from coal or other similar matter by heat; second, to the preparation of this gas for and the after application of it to heat locomotive-boilers and the cars of a train thereto attached, and also to illuminate the latter, as hereinafter described.

In the drawing, No. 1 shows the manner of applying the gas-producer to a car, and also the means by which the gas is applied to the purposes herein set forth. No. 2 is a vertical section of a locomotive-stack with a damper on top, and the steam and heat discharge-pipe leading from it to the train of cars. Nos. 3 and 4 show the manner of heating cars, as hereinafter described. No. 5 is an inside top view of the gas producer or retort. No. 7 is a vertical section of the same. No. 6 is a section of my improved flexible coupling for hot gas, air, or steam pipes.

I will now describe in detail the manner of constructing and using my invention.

The leading idea in the construction of my gas producer or retort is to have it entirely, or as much so as practicable, surrounded by a water-chamber, and this whether the producer is of one or more gas-generating chambers.

H in No. 1 is a side view of the producer—considered as separate from the car—which may be made rectangular or round, and of iron or any other suitable material. In No. 5 one of three chambers is shown, marked Y, respectively, each one being mostly surrounded by the water-chamber or chambers W. V represents the feed-hopper to each chamber, which is on the top and opened and closed by a valve and lever connected therewith. U,

pipes leading therefrom to carry off the gas as generated. No. 7 is a vertical section of the same, showing, further, the air-chamber and ash-pit *a b*, and also the grate-bars T.

In generating gas in this producer, fill the chambers Y with coal or material being used to the depth of two to three feet from the bars, giving it the shape therein similar to that of the bars, and admit only enough air into the chamber *a b* to allow the coal to burn two or three inches on the grate-bars. The coal must be supplied as often as is necessary to keep the above amount on the bars.

Having described the construction and use of the producer or retort, I will now describe its application to heat locomotive-boilers and cars from the gas made therein. H in No. 1 shows it as built with or attached to a tender to be carried with the locomotive or train, or with both. D is a pipe through which the gas is conveyed to the boiler on the locomotive, where it is consumed in the fire-chamber as it emerges from a series of tubes, these tubes being alternative with a series of air-pipes, the object of which is to allow the gas to commingle with air before or at the time of burning. When the fire-chamber B and water in the boiler have become thoroughly heated the valve *m* on top of stack in No. 2 is shut down, and the waste heat passes off, with the steam and draft, through the pipe F, to heat the cars of the train, as hereinafter described. The pipe F, after leaving the stack N, and before or at the place of its connection with the car, is divided into two branches, which are carried the full length and attached to either side of the bottom of the car; or the pipe F may, without said branches, be carried the full length of the car along the center of the bottom, and from it or the branches the heat and steam passing through it or them are carried into registers under the seats of the car, or elsewhere, by small pipes connecting the two, all of which is shown in Nos. 3 and 4.

The force of the steam and the draft created in the locomotive-stack will not only draw the gas off from the producer, but will also force it through the pipe the full length of a train to heat the cars, as before described. But should the draft be insufficient when the train is standing still, it can be maintained by ad-

mitting a jet of steam into the pipe D, before it enters the fire-chamber, through a pipe, c, and, if necessary, this jet of steam may be made a constant one.

As it is necessary that the pipes on or belonging to each car should be connected by a fire-proof flexible coupling, I have invented one having such properties, which I will now describe: No. 6 shows a section of it, and it consists of a gum or duck—a kind of cloth—tube or pipe, lined within with asbestos cloth, and having any suitable arrangement on both ends to connect it with the pipes.

As before stated, the producer-chamber or chambers are surrounded, as near as can be, with a continuous water-chamber, the uses of which are these: First, the water-chamber being full of water, it becomes there heated before entering the boiler, as it is intended that the water to supply the boiler, or a portion of it, is to be carried in said chamber, and all used to pass through it; second, the use of said water-chamber allows the producer to be made of metal, as the water will prevent the metal or any other suitable material from burning out.

The gas-producer, in the manner before stated, being too weak in carbon for illuminating purposes, I enrich enough of it for such purpose by having a division, Y², in No. 5, in the producer, wherein I use in making gas, in combination with coal, thick petroleum, tar, or cannel coal, which gas is conveyed by a pipe to a condenser and purifier in the baggage or other car, from which it is conveyed by a pipe to one or more holders, either in one car or on different cars, from which holders it is taken to be burned for light in the cars, the coup-

lings of said pipes being the same as used for the steam and heat pipes.

A producer can be made of such capacity to generate sufficient gas to produce steam to run the train and also to illuminate the cars without encumbering the locomotive or train with any additional coal, or not to any great extent, than is now belonging and pertaining to a train. This producer is also applicable, for the same purpose, to steam-boats, ships, and, indeed, wherever steam, heat, and light are needed, or for any one or more of said uses.

The construction and use of all apparatus herein used, and not hereafter claimed as new of themselves, are of the ordinary kind, and familiar to persons skilled in the art or science to which this appertains.

What I claim as new and my invention is—

1. In the gas-producer herein described, the water-chamber W, substantially as and for the purpose set forth.
2. The flexible pipe-coupling c D, made of gum or duck and lined within with asbestos cloth, substantially as and for the purpose set forth.
3. The producer Y Y, gas-pipe D, locomotive fire-chamber B, and locomotive-stack N, substantially as and for the purposes set forth.
4. The producer Y Y, heat-pipe F, and heat-pipe or pipes S, substantially as and for the purposes set forth.
5. Producing-chambers Y Y and gas-pipe E, substantially as and for the purpose set forth.

JOSEPH H. CONNELLY.

Witnesses:

J. BOONE McLURE,
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