

No. 105,561.

PATENTED JULY 19, 1870.

W. FOSTER, JR. & G. P. GANSTER.  
GAS APPARATUS FOR RAILROADS, &c.

Fig. 1.

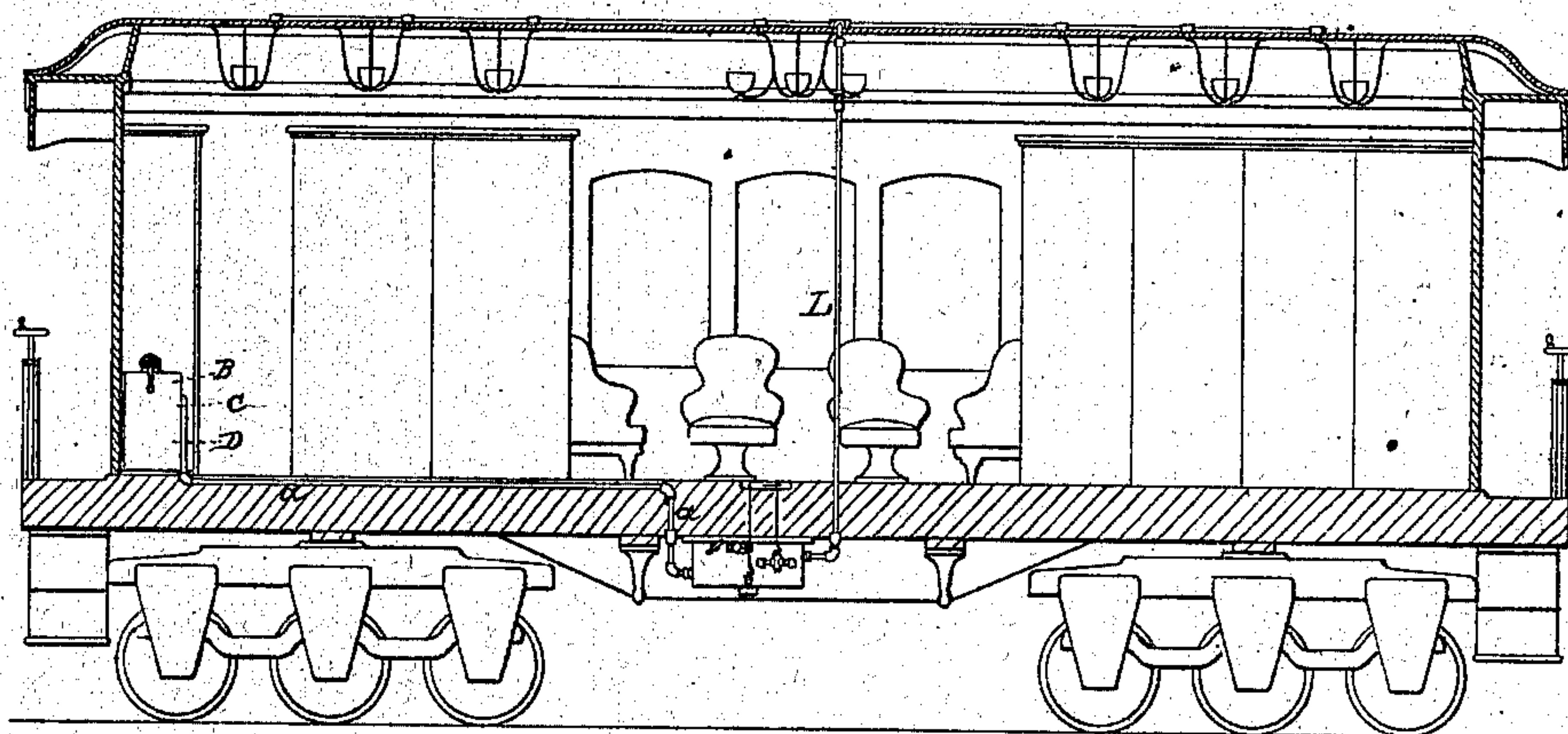


Fig. 2.

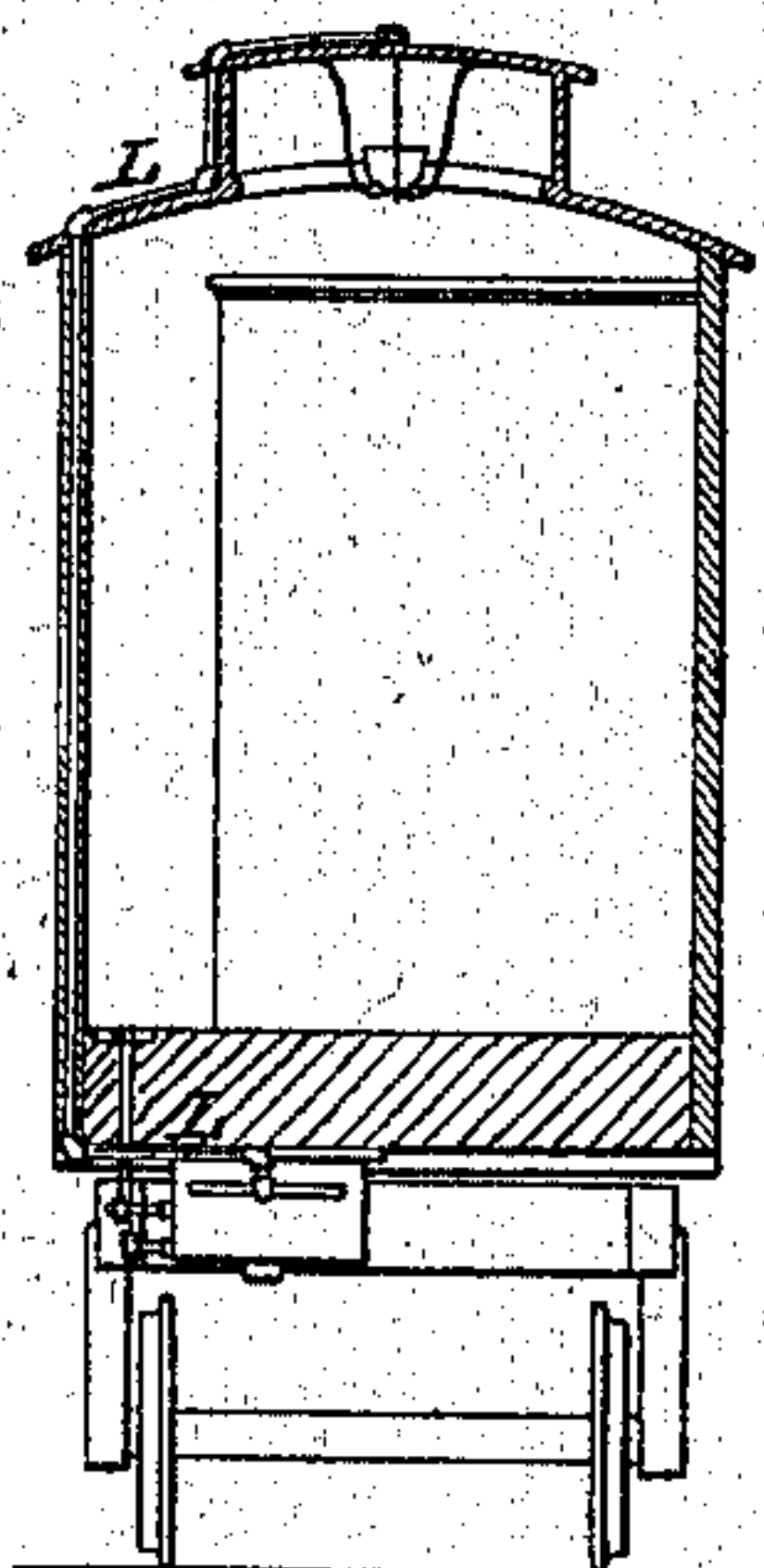


Fig. 3.

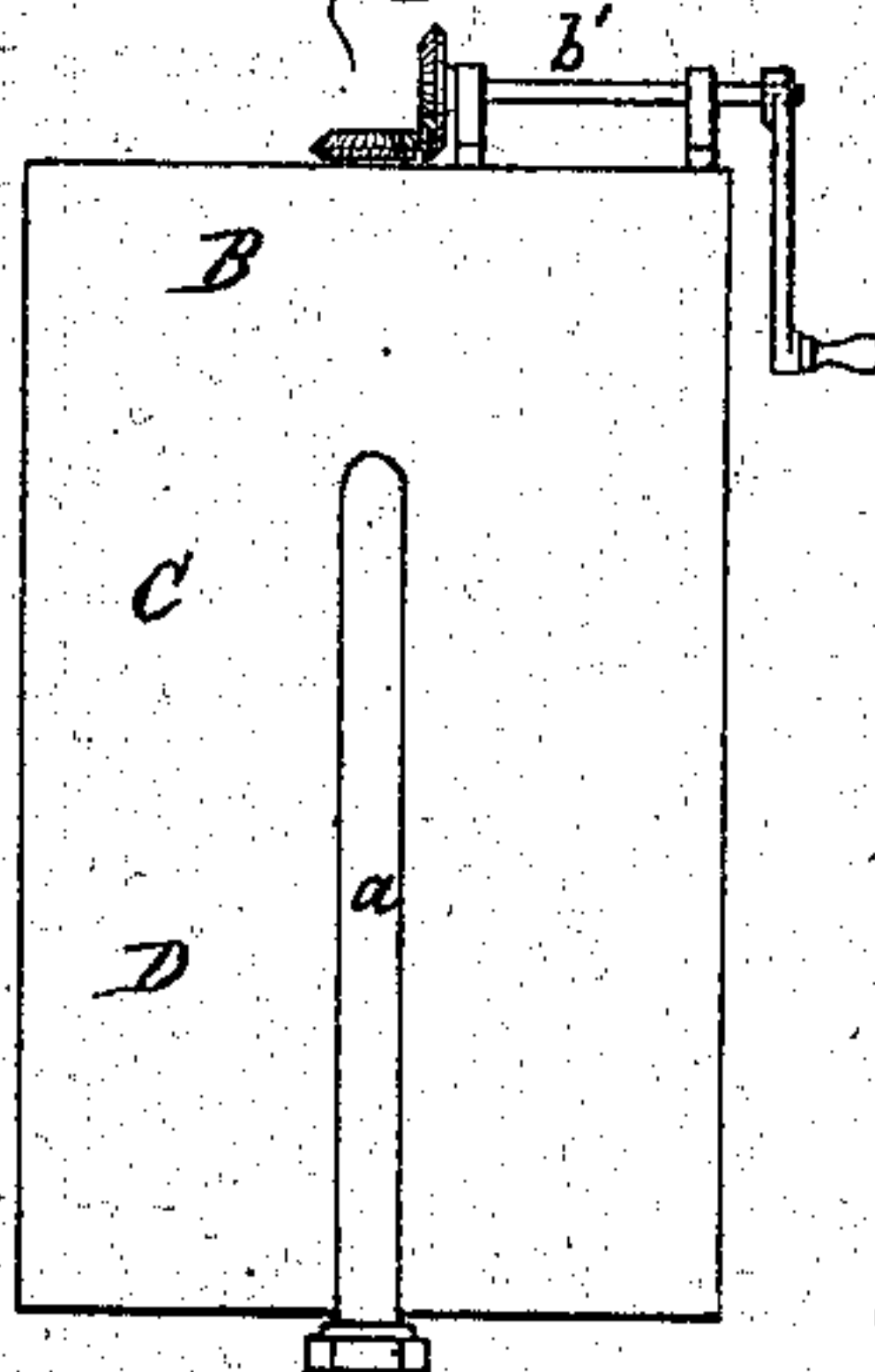


Fig. 4.

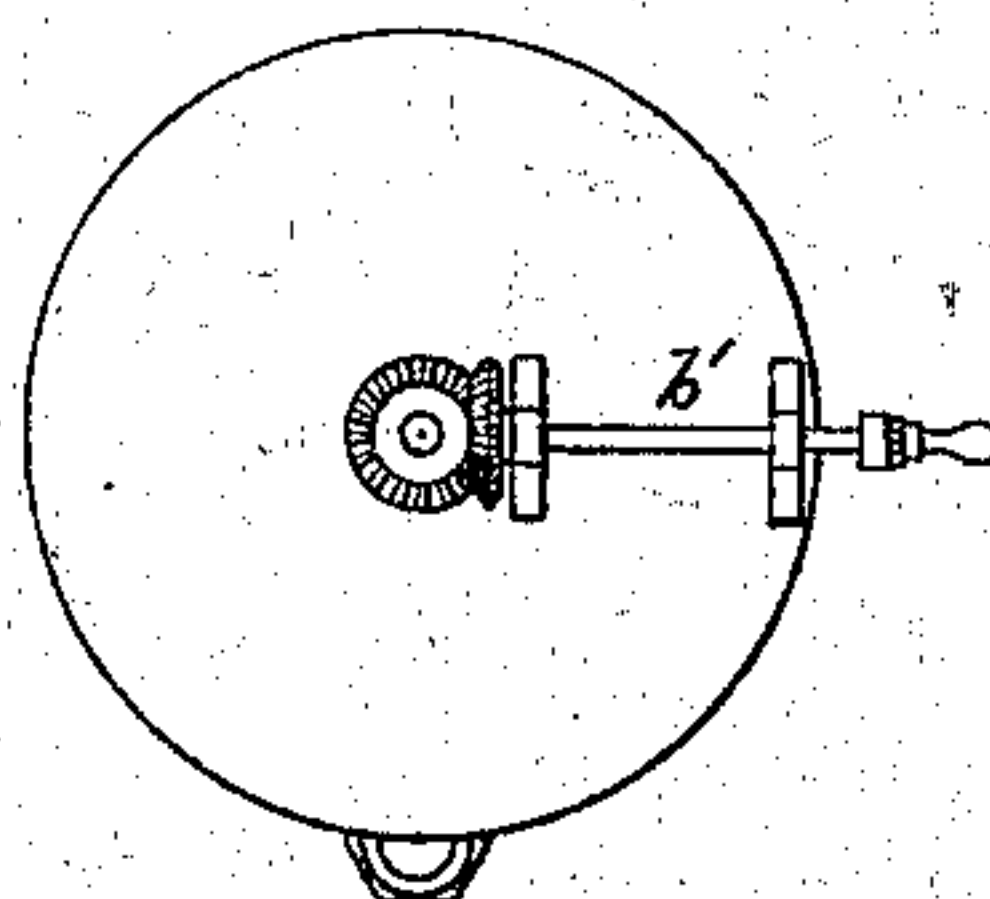


Fig. 5.

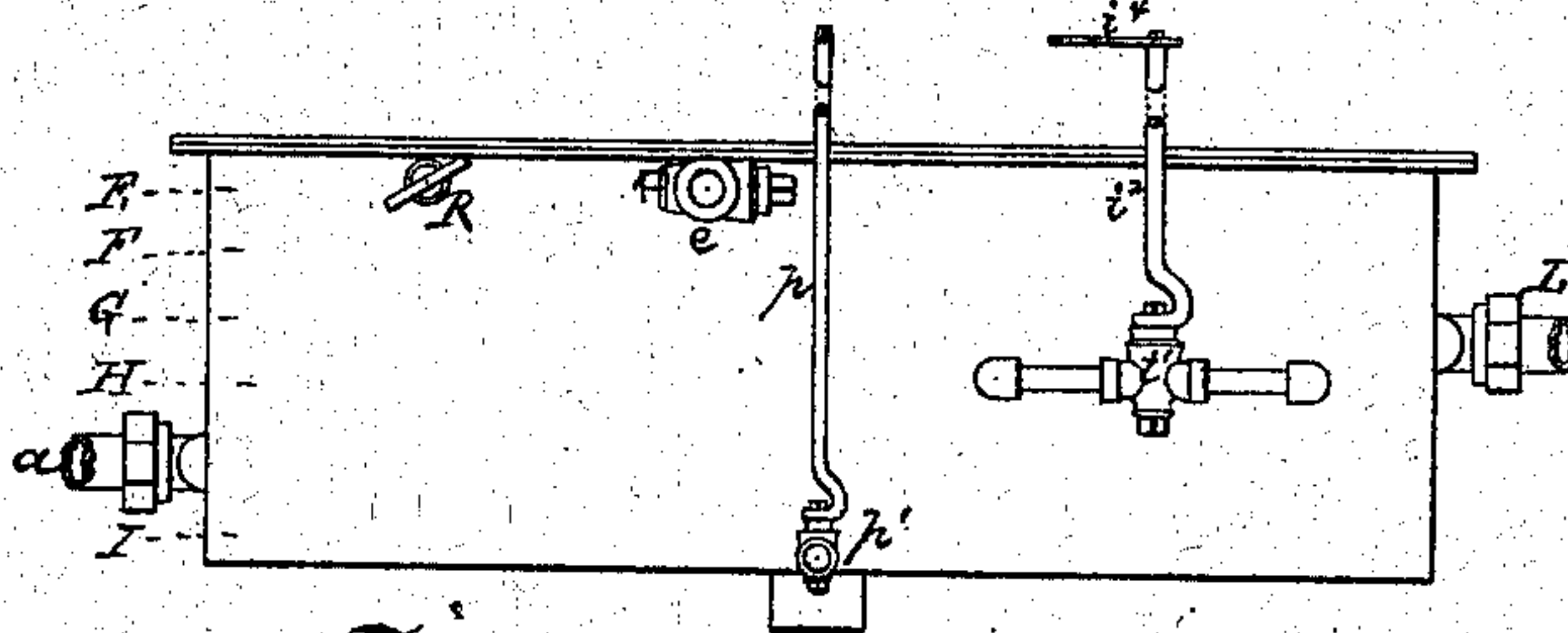


Fig. 6.



Witnesses,

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# United States Patent Office.

WILLIAM FOSTER, JR., OF NEW YORK, N. Y., AND GEORGE P. GANSTER, OF  
READING, PENNSYLVANIA.

Letters Patent No. 105,561, dated July 19, 1870.

## IMPROVEMENT IN GAS APPARATUS FOR RAILROADS, &c.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern:

Be it known that we, WILLIAM FOSTER, Jr., of the city and county of New York, in the State of New York, and GEORGE P. GANSTER, of Reading, in the county of Berks, in the State of Pennsylvania, have invented certain new and useful Improvements in Gas Apparatus; and we do hereby declare that the following is a full and exact description thereof.

We are and have been for several years engaged in the manufacture of portable gas apparatus. Our patent dated December 8, 1868, describes a very efficient and successful apparatus adapted for use on railroad cars, and which will give a steady and reliable light for a long period, independent of the varying inclinations and joltings of the car. It also provides for holding the gasoline in the interstices between the fibers of cotton wicking, or analogous material, whereby its flowing out and vaporization is regulated, and also the evils due to a fracture of the apparatus in case of a collision or other accident, are greatly lessened. Our present improvement is based on that therein described. We have made material improvements.

Railroad cars which are employed on long routes, and which are required to be on the road through successive days and nights; as for instance, those on the Pacific railroad from Omaha to the Pacific coast, may be lighted throughout the whole journey by our apparatus, without requiring refilling or any attention except winding up the blowing mechanism and adjusting the feed when required for use, each day, and an occasional discharge of the denser and unevaporated portion of the gasoline, which we denominate the "drip." Our invention provides convenient means for effecting this latter operation while in full motion, so that no increase of labor is involved during the brief stoppages, and no offensive smells at or in the vicinity of the stopping places.

We make smaller sizes of the same apparatus for shorter routes. In our previous apparatus the means for controlling the flow of gasoline into the evaporating-chambers were not fully reliable and capable of exactly measuring the quantity, and (what was not the least important) the spilling of any material in either emptying the drip or supplying fresh gasoline to the apparatus, was liable to soil the floor, and cause a temporary or permanent offensive condition in the car. All these are remedied by our present invention.

We will first proceed to describe what we consider the best means of carrying out our invention, and will afterward designate the points which we believe to be new therein.

The accompanying drawing forms a part of this specification.

Figure 1 is a longitudinal vertical section through a car provided with our invention.

Figure 2 is a transverse section of the same.

The remaining figures indicate detailed parts of the apparatus on a larger scale.

Figure 3 represents the vessel in which the blowing is effected, and in which the spring and other mechanism is contained for treasuring and giving out the power;

Figure 4 is a plan view of the same; and

Figure 5 is a side elevation of the reservoir and evaporating-vessel.

Figure 6 shows the index  $i^2$  and graduating-scale  $i^4$ .

It will be seen in Figure 8 that, while the blowing-vessel and its mechanism are within the car, the evaporating-vessel and reservoir are outside the car. But certain important movements or adjustments, with regard to the latter, may be controlled from within the car, by properly manipulating by the aid of rods passing up through the floor.

Similar letters of reference indicate like parts in all the figures.

In figs. 1 and 2, the general outlines of a passenger-car will be readily recognized. The floor is represented as thicker than ordinarily constructed, in order to give increased clearness to the figures. Nine burners, with their accompanying glass shades, of the ordinary approved and tasteful character, are represented, but the number of lights may be increased or diminished at will.

The blowing apparatus is marked, as in our previous patent, B C D.

The reservoir, evaporating-chambers, and space below the latter to receive and accumulate the unevaporated drip, are marked, as in our previous patent, E, F, G, H, and I.

The entire blowing apparatus B C D is within the car, and may be locked in a small closet in one corner.

The air steadily blown from this apparatus by the contained blowers or bellows, not represented, flows through a suitable pipe,  $a$ , down to or within the floor, then flows along horizontally until it is near the center of the length of the car, then turns downward, and passing out through the bottom of the car, is united by proper connections to the evaporating vessel and its connections. The latter being outside of and below the body of the car, reduces or annihilates the risk of diffusing any bad smell in the car under any circumstances.

The gas produced in the evaporating-vessel flows out and upward through a pipe, L.

The blowing, the evaporating, and the distribution of the gas, as also all the points not here particularly described, may be as in our former patent referred to.



A suitable coiled spring, of great power and compass, is inclosed in the upper portion of the blowing chamber, and is wound up by applying power to the shaft *b*<sup>1</sup>. The winding may be done once a day, or at longer or shorter intervals, as required.

The power thus treasured operates a set of bellows of an ordinary or any suitable pattern, and the air thus impelled is driven into the lowermost of a series of evaporating-chambers.

These chambers are filled with properly-prepared sponge, more or less saturated with gasoline, by a gradual flow of the gasoline from a reservoir above into the successive chambers below. The uppermost evaporating-chamber being very wet with fresh gasoline, completes the saturation of the air, and the air, thus saturated, generally denominated gas, is led off to the burners.

One of our chief improvements consists, as before stated, in the arrangement of the parts of the apparatus, whereby the portion liable to be in any manner offensive is outside of the car.

We will now describe the others.

We fill the reservoir through a short pipe, *e*, which may, if preferred, be bent as represented in our previous patent. It is securely stopped when the filling is completed.

The supplying of a large quantity of gasoline must necessarily displace a corresponding bulk of air or gas. We provide for this by opening an air-cock, *R*, in the vicinity of the feed-pipe *e*. So soon as the filling is completed, the air-cock *R* is again closed.

To discharge the drip at intervals, we turn a cock, *p*<sup>1</sup>, by means of a rod, *p*, which extends up through the floor of the car. By this means the discharge may be made while running, and, after holding it open a brief interval, it is again closed, and allowed to stand closed for a long period, say twenty-four hours, when it should be opened again for a little time.

We control the flow of the gasoline from the reservoir into the evaporating-chamber by a very accurately-constructed cock, *i*<sup>1</sup>, operated by a rod, *i*<sup>2</sup>, having an index, *i*<sup>3</sup>, working on a graduated scale, *i*<sup>4</sup>, placed in a recess in the floor of the car.

The rod *i*<sup>2</sup> reaches up nearly through the floor of the car.

The index *i*<sup>3</sup> turns in a recess sunk in the floor. It may be covered by a brass plate or other suitable cover, to protect it from injury or curious inspection, but it is important that the covering be easily removed to allow the attendant to adjust the cock at pleasure. The index *i*<sup>3</sup> standing at any particular point on the scale *i*<sup>4</sup>, experience soon teaches the operator at what point to keep it in every part of the journey to insure a uniform light. When the apparatus has been fresh filled the cock should be nearly

closed, and, as it becomes emptied, the cock should be opened further.

The scale and index afford a very exact means of determining the correct position, and allow the cock to be adjusted or opened and closed with greater delicacy than in any ordinary apparatus.

Many obvious details of some importance are omitted in this description, from regard to brevity.

We prefer to make the main casings of stout galvanized iron, and the cocks and connections of brass, and to hold the evaporating-vessel and reservoir up to the floor-timbers of the car, by providing a stout flange at its upper edge, which is first held up temporarily against the floor-timbers by clamps or wood-screws, and is afterward very strongly secured by bolting around the entire structure a rectangular framing of wood, which takes under the flange, and confines the whole so strongly as to resist any ordinary violence.

We claim—

1. In combination with a railroad car, a gas apparatus, having the evaporating-chamber and its connections outside the vehicle, substantially as specified.

2. The feed-cock *i*<sup>1</sup>, with its rod *i*<sup>2</sup> extending through to the interior of the car, and index and scale *i*<sup>3</sup> *i*<sup>4</sup>, combined and arranged as represented relatively to a gas apparatus outside of the car, as specified.

3. In combination with a gas apparatus outside of a railroad car, the drip-cock *p*<sup>1</sup>, operated by the rod *p*, extending through to the interior of the car, as and for the purposes herein set forth.

4. A blower, operated by a spring, in connection with a gas apparatus, so constructed that it can be placed in any convenient place in a car, boat, or other carriage, and so arranged that it can be wound when the vehicle is in motion, and the lights are burning, as shown, and for the purpose set forth.

5. The combination of the following elements: a railroad car or analogous moving structure adapted to carry passengers; a blowing apparatus within the structure; an evaporating apparatus outside; a provision for discharging the drip or unevaporated portion by operating on the inside of the structure; provision for regulating the amount admitted to the evaporating-chambers, and exactly gauging the aperture from the interior of the structure; and provisions for filling and for discharging the air or gas during the filling operation, all combined and arranged for joint operation, as herein specified.

In testimony whereof we have hereunto set our names in presence of two subscribing witnesses.

WM. FOSTER, JR.

GEO. P. GANSTER.

Witnesses:

A. B. HINE,

JAMES S. GRINNELL.