

W. H. H. BOWERS.

Apparatus for Propelling Street-Cars by Compressed Air.

No. 142,433.

Patented September 2, 1873.

Fig. 1.

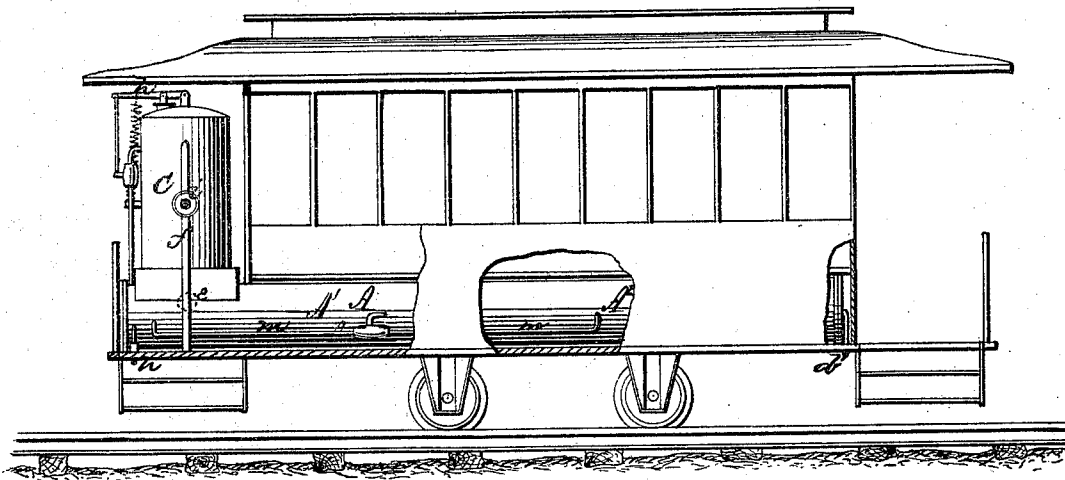
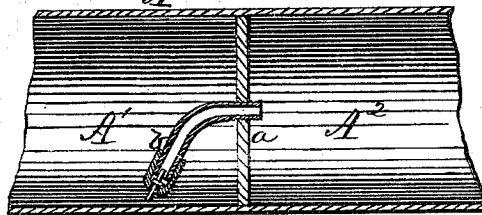


Fig. 2.



Witnesses
John A. Ellis
E. C. Ellis

Inventor
William H. H. Bowers
Per
W. Alexander Ho
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM H. H. BOWERS, OF FRANKLIN, KENTUCKY.

IMPROVEMENT IN APPARATUS FOR PROPELLING STREET-CARS BY COMPRESSED AIR.

Specification forming part of Letters Patent No. **142,433**, dated September 2, 1873; application filed July 30, 1873.

To all whom it may concern:

Be it known that I, WILLIAM H. H. BOWERS, of Franklin, in the county of Simpson and in the State of Kentucky, have invented certain new and useful Improvements in Apparatus for Propelling Street-Cars by Compressed Air; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon which form a part of this specification.

The nature of my invention consists in the construction and arrangement of an apparatus for propelling street-cars, &c., by compressed air, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawing, in which—

Figure 1 represents a side elevation, and Fig. 2 is a detached sectional view.

A represents a tubular chamber or tank made of boiler-iron, and running the full length of a street-car directly under the seat. I have a chamber of this kind on each side of the car. The one on the opposite side is not shown in the drawing, but referred to in this specification by letters B, and its chambers by B¹ and B². Each chamber or tank is divided into two compartments, marked A¹ A² and B¹ B², respectively, by means of partitions *a a*, which compartments are connected together in such a manner by pipes and valves that the air admitted into the compartment A¹ passes into the compartments A² B¹ B² until the whole are equally charged. Check-valves *b b* are situated in the partitions *a a*, as well as in the end of a pipe, *d*, in the compartment B¹, which pipe connects said compartment with the compartment A². The air is received into the chambers or tanks from the stationary condenser by means of hose and coupling at *e*, to which is attached another check-valve on the inside of the chamber A¹.

The air passes first into this chamber, then through the check-valve *b* into A², and thence, by the pipe *d*, into B¹, and from the same into

B² through the check-valve in the partition between said compartments.

C represents a separate and distinct chamber or tank, and is termed the working chamber or tank. The object of this is to carry a pressure of two hundred to three hundred pounds to the square inch in the chambers or tanks A and B, and to maintain a uniform working pressure in the tank C of not more than twenty to forty pounds to the square inch, varied by setting the spring or scale of the governor according to the general service required to be performed or grades and levels to be overcome. The pressure in the tank C is regulated by means of a governor placed between the tanks A, B, and C. *f* is the feed-pipe between the supply-tanks A B and the working-tank C. *h* is a safety-lever, which is lifted by the piston when the pressure in the working-chamber C has reached the maximum amount of pressure, and cuts off the further supply at the valve *i* in the pipe *f* until the pressure is again reduced in the working-chamber C below the maximum pressure, and then the valve *i* again opens, allowing the supply to be again resumed. To further economize the compressed air and hold it in reserve, each chamber is held in check by check-valves *b*, and can be let into the chamber A¹ from the chambers A², B¹, and B², by means of pipes *m m* and stop-cocks attached to the same, at the will of the engineer as the power diminishes in the chamber A¹. *n* is the pipe supplying the cylinders on the under side of the car.

The air is let in and shut off by means of a globe or throttle valve.

It is found very difficult to construct tanks, tubes, or pipes that will hold air under a high pressure, owing to its escaping through the pores of the iron, rivets, &c. In order to overcome this difficulty, which is a very material one, I coat the inside of all the tanks, reservoirs, pipes, &c., with a composition of varnish and boiled linseed-oil; or by using glue and molasses melted and in proportion to form a compact and elastic paint, to be applied the same as the former; or, in fact, any composition that will stop the pores and seams having enough elasticity to bear the ordinary

expansion of tanks under the pressure without cracking.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The tanks or cylinders A and B, arranged, as described, in compartments, and provided with valves and pipes, substantially as and for the purposes herein set forth.

2. The combination of the supply - tanks

A B and working-tank C, constructed, arranged, and connected together substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WILLIAM H. H. BOWERS.

Witnesses:

A. SALMONS,
JOHN BREVARD.