J. GRISCOM.

COMPRESSED AIR HOLDERS FOR THE ENGINES OF STREET CARS.

No. 179,300. Patented June 27, 1876.

Fig. 2.

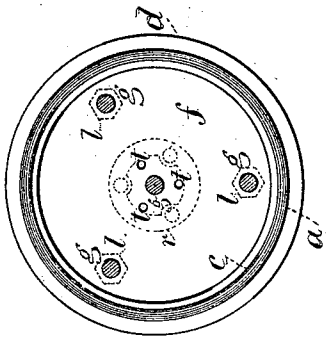
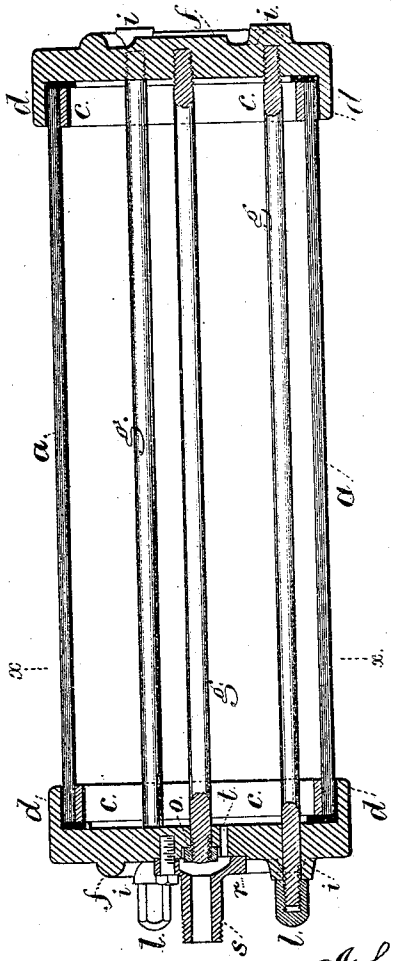


Fig. 1.



Witnesses

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atty

UNITED STATES PATENT OFFICE.

JOHN GRISCOM, OF NEW YORK, N. Y.

IMPROVEMENT IN COMPRESSED-AIR HOLDERS FOR THE ENGINES OF STREET-CARS.

Specification forming part of Letters Patent No. **179,300**, dated June 27, 1876; application filed December 6, 1875.

To all whom it may concern:

Be it known that I, JOHN GRISCOM, of the city and State of New York, have invented an Improvement in Holders for Compressed Air or Gases for Engines or for other purposes, of which the following is a specification:

Great difficulty has heretofore been experienced in obtaining a holder adapted to street-railway cars for containing compressed air to operate the propelling-engine. Metal tanks are heavy and liable to leak, besides which the pressure upon the flat or nearly flat heads is liable to cause a separation of the head from the metal of the cylinder.

My invention is for lessening the weight of the air-holders, and for sustaining the heads independent of the cylinder, so that there will not be any strain at the joints between the heads and cylinder in consequence of pressure upon the heads.

In the drawing, Figure 1 is a longitudinal section of the air-holder complete, and Fig. 2 is a cross-section at the line *x x*.

The cylinder *a* is made of paper, rolled upon a core, and the respective thicknesses secured together by adhesive material, such as glue. Care should be taken to roll the paper so that the greatest strength will be circumferentially of the cylinder.

The core upon which the cylinder *a* is made should be in sections like a hat-block, so that it can be removed with facility after the cylinder has been completed and thoroughly dry. The outside and inside surfaces of this cylinder are preferaby coated with water-proof material, such as paint or varnish, and the ends are dressed off true and of a shape to suit the metallic or paper heads. There is a metal band, *c*, slightly tapering, driven into each end of the cylinder, to sustain the paper against the pressure of packing material introduced between the flange *d* of the head *f* and the said cylinder *a*, and suitable washers are by preference introduced between the ends of the cylinder and the surfaces of the heads.

The heads *f* are connected together by the tie-bolts *g*, and these are more or less numerous, according to the size of the cylinder and the pressure to be sustained. It is preferable to screw these tie-rods into hollow sockets *i* in one head, so that there will not be any hole through said head, and the other ends of the tie-rods that pass through the other head *f* are provided with nuts *l*, which are not of the ordinary character, but are hollow, cap-shaped, so that air passing through between the screw and nut cannot escape, and there is only one flat face to each nut, that is rendered perfectly tight by any suitable washer, or by red lead or similar material. These tie-bolts serve to hold the heads together under the pressure to which they are subjected without any strain coming upon the cylinder from the pressure upon the heads.

The central tie-rod is preferably made with an ordinary nut, *o*, that comes within the cavity of the coupling or flange *r* of the connection *s* for the air-pipe, so that there will not be leakage at this nut, and around this tie-bolt and nut are the openings *t*, that allow the atmosphere, under pressure or otherwise, to pass freely into or out of the holder.

The heads of the cylinder may be of metal or of paper pressed into a suitable mold, the layers of paper being cemented together, and the direction of the fiber in one sheet crossing those of the adjacent sheets.

I claim as my invention—

1. The holder for compressed air or gas, constructed of a cylinder of paper with heads connected together by tie-bolts with cap-shaped nuts, substantially as set forth.

2. The combination, with the paper cylinder and heads, constructed as specified, of the tie-bolt passing from one head to the other, and the coupling-flange *r*, inclosing the nut of the tie-bolt, as set forth.

Signed by me this 3d day of December, A. D. 1875.

JOHN GRISCOM.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.