(No Model.) 2 Sheets—Sheet 1.

J. STEPHENSON.

TRAM CAR ROOF.

No. 378,470. Patented Feb. 28, 1888.

Fig. 1.

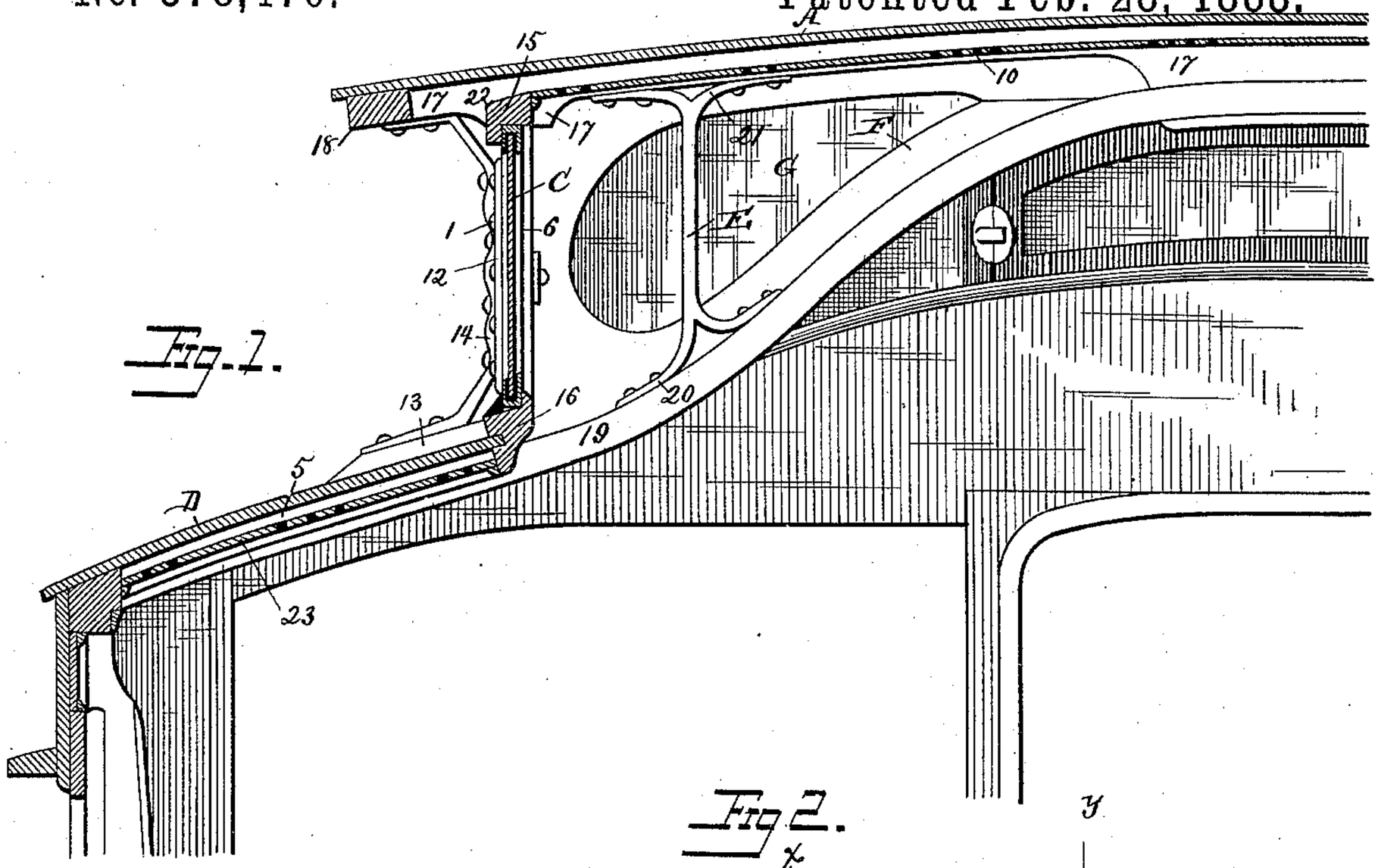
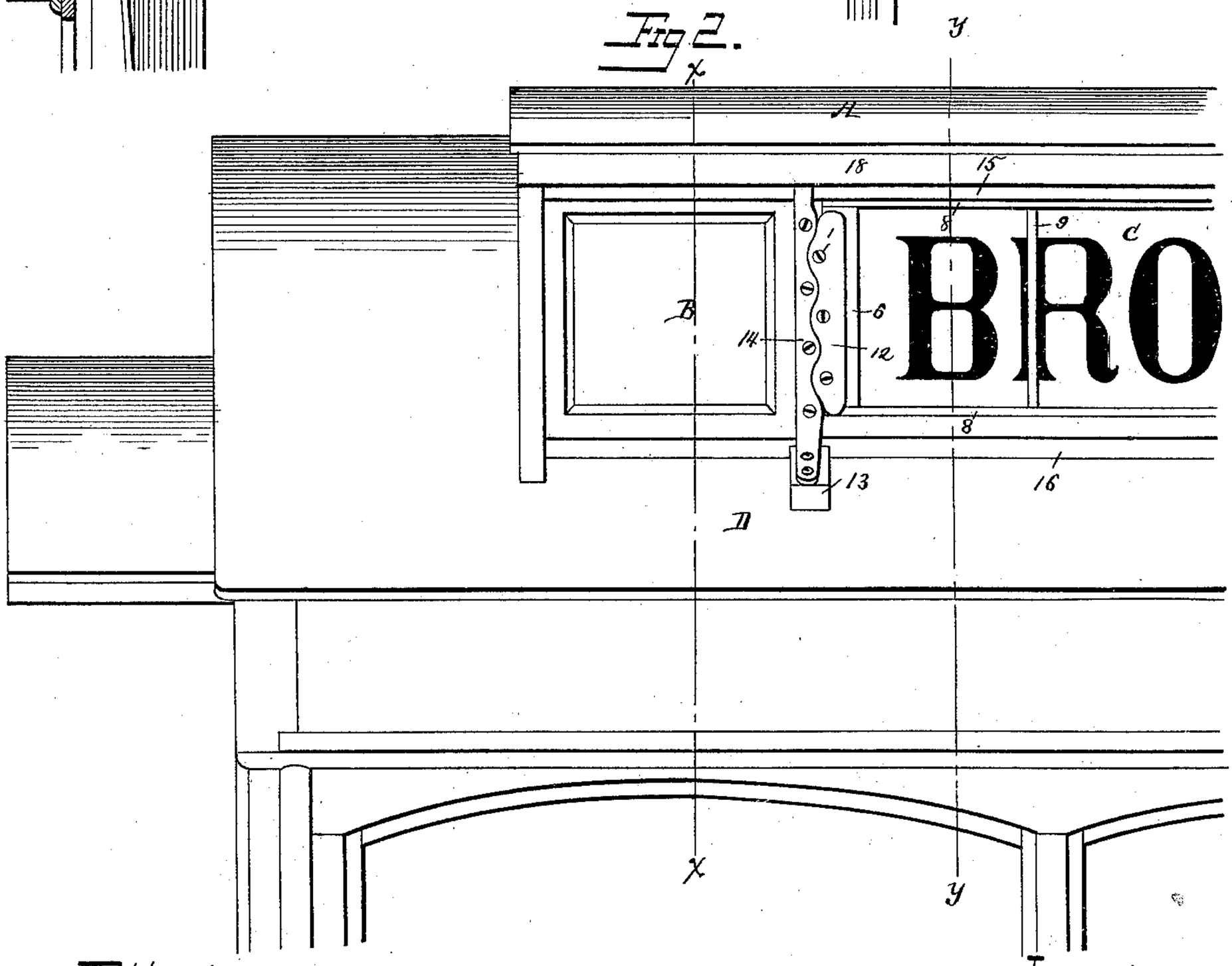


Fig 2.



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(No Model.) 2 Sheets—Sheet 2.

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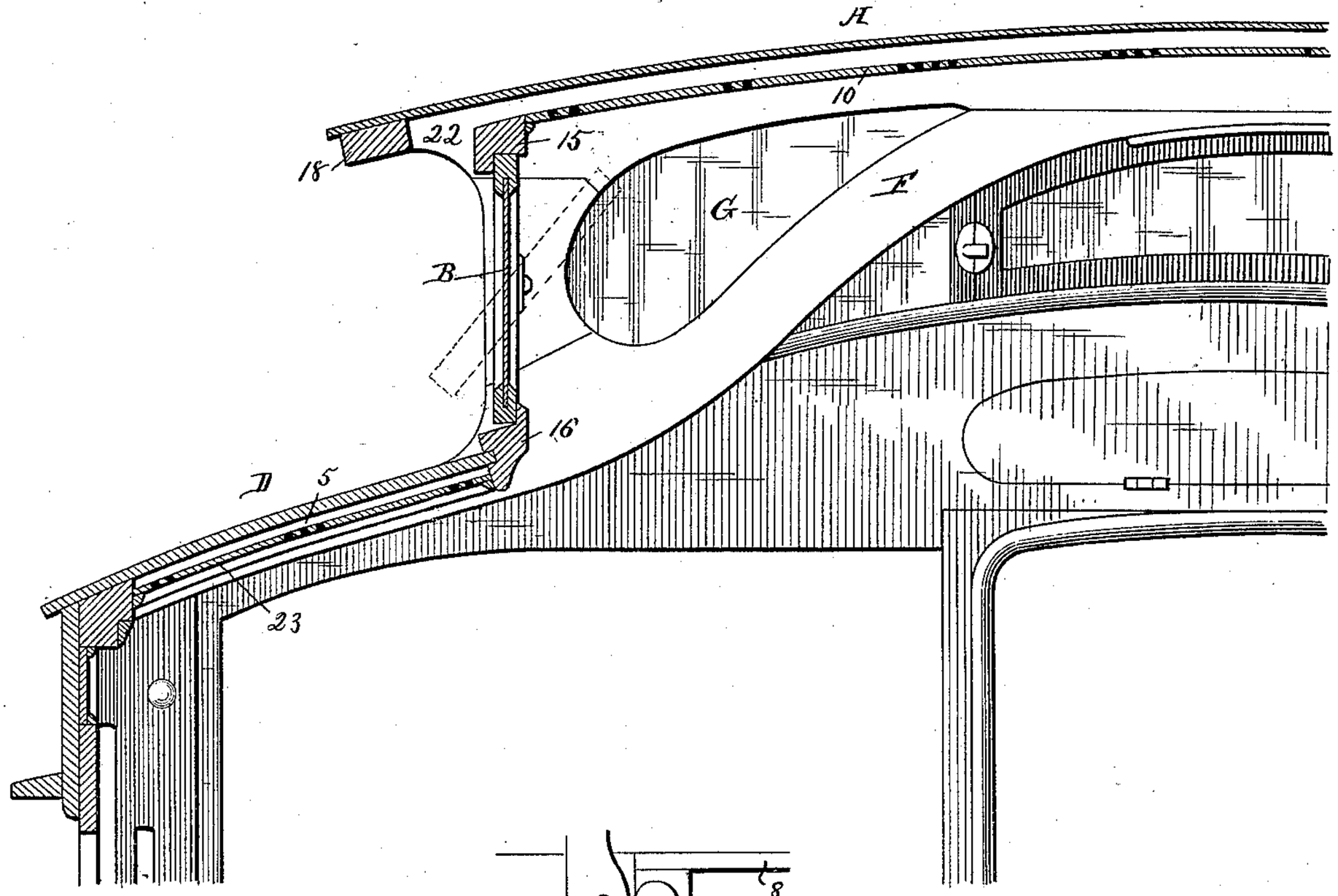
Fig. 3.



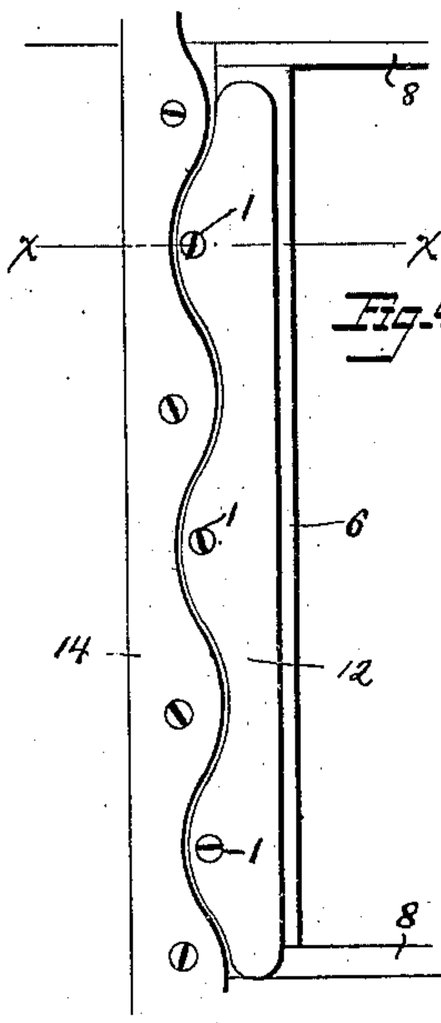


Fig. 4.

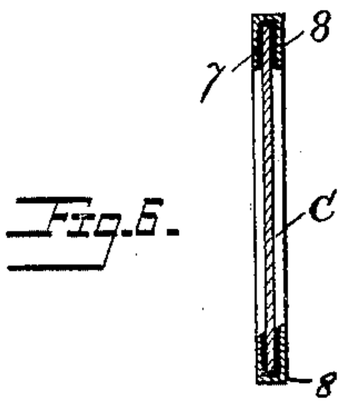


Fig. 6.

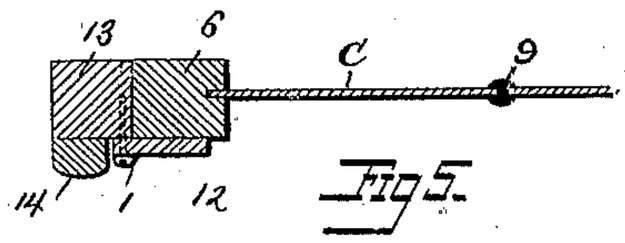


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN STEPHENSON, OF NEW YORK, N. Y.

TRAM-CAR ROOF.

SPECIFICATION forming part of Letters Patent No. 378,470, dated February 28, 1888.

Application filed June 9, 1887. Serial No. 240,839. (No model.)

To all whom it may concern:

Be it known that I, JOHN STEPHENSON, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Tram-Car Roofs, of which the following is a specification.

This invention relates generally to the construction of tram-cars, but more particularly in the present case to an improved roof for such cars; and to this end the invention consists in the novel construction and arrangement hereinafter fully set forth.

In the accompanying drawings, Figure 1 represents a vertical cross-section of about half of the improved roof portion of a tram-car, said section being taken on the line *y* of Fig. 2. Fig. 2 is a side elevation thereof looking at the exterior of the car. Fig. 3 is a sectional elevation similar to Fig. 1, but taken on the line *x* of Fig. 2. Fig. 4 is an enlarged side elevation of the serrated stile-plate and vent-pillar stay, and Fig. 5 is a horizontal section of the same taken on the line *x*. Fig. 6 is an enlarged vertical section of the top and bottom rails of the frame holding the lettered glass.

The great desiderata in tram-cars of the present day is to provide a car structure in which the minimum amount of framing will obstruct the field of vision, and to provide them with as high window-sashes as the strength and safety of the structure will permit. As this extreme height of sash in tram-cars materially restricts or removes the letter-board and consequently the lettering thereon which designates the route of the car, I provide other means for containing the designating lettering that is better adapted to the purpose because visible day and night.

To this end I make in part a new construction of the car-roof, for which purpose I prefer a car with upper work having the appearance of a Bombay-top, as shown in Figs. 1 and 3, which has the roof ventilators extending nearly the length of the car. After reserving so much of each end of the elevated top as may be desired for adjustable ventilators B, (see Fig. 2,) I appropriate the central portion of the sides of the elevated top for continuous glass C, on which is put the desired designating lettering, which is thus transparent. This lettered glass may be employed in sections with lead, 9, in the joints of the abutting sections and arranged to be hidden in the body of some of the designating letters, as, for instance, in the vertical portion of the letter R. The lettered glass is preferably put in its own frame, the bottom and top rails, 8, of which frame are metal channel-bars filled with rubber 7, grooved to receive the edges of the lettered glass. (See Fig. 6.) The ends or stiles 6 of this frame hold the ends of the glass and receive fastening-screws toward one edge of a stile-plate, 12, which has its other edge serrated and screwed, as at 1, to the adjoining vent-pillar 13, the serrated edge of the stile-plate corresponding with a like serrated edge of a vent pillar stay, 14. The upper edge of the lettered glass-frame is lodged in a recess of the vent top rail, 15, and the lower edge in the vent-sill 16.

Beyond each end of the lettered glass the vent-pillar stay 14 unites the lower end of the vent-pillar with the roof-rafter 17 and the upper end of the same stay with a cross-rafter, 18, (see Fig. 1,) thus giving the strength required to carry the lettered-glass frame which has its ends supported by its stile-plates 12, serrated and interlocked with the serrated edges of the vent-pillar stays 14 and there fastened, thus supporting the lettered-glass frame and holding it firmly in place.

Ordinary construction would have no connecting frame-work between the upper and lower rafters, 17 19, along the lines of the lettered-glass frames, and consequently these sections of the upper and lower roofs, A D, would be subject to destructive quivering motion, which I prevent by introducing at intervals metal roof stays E with feet 20, secured to the lower rafters, 19, and heads 21, secured to the top rafters, 17. (See Fig. 1.) The roof-stays E are located remote from the inner face of the glass, so that the light within the car may not cause the stays to cast shadows, confusing the lettering on the glass.

The end walls or bulk-heads, F, of the elevated roof A, usually solid and blank, give a heavy and inelegant appearance to the car top, which I now improve in appearance and utilize. To this end I make openings in the part

of each bulk-head which appears above the roof. In these openings I place glass, G, of any desired color or figure or ornamentation. Through these glasses the light from the inside lamps shine, and constitute a signal by which passengers can distinguish the approaching car. This peculiar signal has become the more necessary because of accumulating lines of cars running on the same tracks, and being over the lower car-roof are not liable to be obscured as are the usual bull's-eye side lights.

For purpose of ventilation I make between the vent top rail, 15, and the upper roof, A, open spaces 22 for exit of foul air from between the perforated ceiling 10 and the roof; and in this connection I construct overhead the car-seats and under the lower roof, D, a series of perforated panels, 23, fitting between the rafters 19, and having air-spaces 5 between the ceiling or perforated panels and the roof-boards. The ceiling-panels 23 being an inclined plane the air enters the lower perforations and exits through the upper, escaping from the car at the open spaces above. Thus when the summer sun is upon the car-roof the moving air between the roof and ceiling-panels prevents the heated roof from warming the atmosphere inside the car, and also causes circulation of the air within the car, which ascends and escapes through the roof-ventilators B, or *via* the upper perforated ceiling, 10, and verge openings.

I claim—

1. A tram-car having the longitudinally-central part of its roof elevated, and with the side walls of the elevation built upon the rafters, the end sections of each side wall occupied with adjustable ventilators, and the central space between those end vent-sections occupied with fixed glass having lettering visible day and night, as and for the purpose described.

2. A tram-car with transparent lettering panel in a fixed frame lodged on the car-roof, distant from its edge, the vent-sill intervening between the lettering glass frame and the roof-rafters, and the vent top rail intervening between the lettering glass frame and the cross-rafters, as and for the purpose described.

3. A tram-car with "Bombay top," bulk-heads opened, and in the openings fixed glass signals illuminated by the car-lamps, as and for the purpose described.

4. A tram-car with its ceiling over the seats at the inclined part of the roof perforated at its lower and upper margins, and placed at a distance below the roof-boards, permitting air to enter the lower perforations and pass upward between the roof and ceiling, and out through the upper holes, escaping at openings above, as and for the purpose described.

5. A tram-car with a lettered glass frame in the side walls of the elevated roof, the frame supported at each end by a stile-plate, one edge of which is secured to the frame and the other edge serrated in unison with the vent-pillar stay, and fastened to the same vent-pillar, as and for thepurpose described.

6. A tram-car with lettered glass frame resting on the roof-rafters, and with cross-rafters resting on the lettered glass frame, the cross and roof rafters held from separation by stays remote from the side walls of the elevated roof, as and for the purpose described.

7. A tram-car with lettered glass side walls to the elevated roof mounted in a channeled metal frame, and the section-joints of the glass filled with lead or other suitable substance, as and for the purpose described.

8. A tram-car with parts of the roof over the seats inclined and ceiled with perforated panels, unobstructed air-spaces between the ceiling and the roof-boards, perforations near the lower and upper ends of the side ceiling panels, and above the upper ends of the ceiling panels in the side walls of the elevated roof openings or passages for outgoing air, as and for the purpose described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN STEPHENSON.

Witnesses:
JOS. B. STEPHENSON,
S. A. STEPHENSON.