A. L. BUSH.

RAILROAD TRAIN SHED.

APPLICATION FILED NOV. 10, 1910.

1,101,783.

Patented June 30, 1914.

3 SHEETS—SHEET 1.

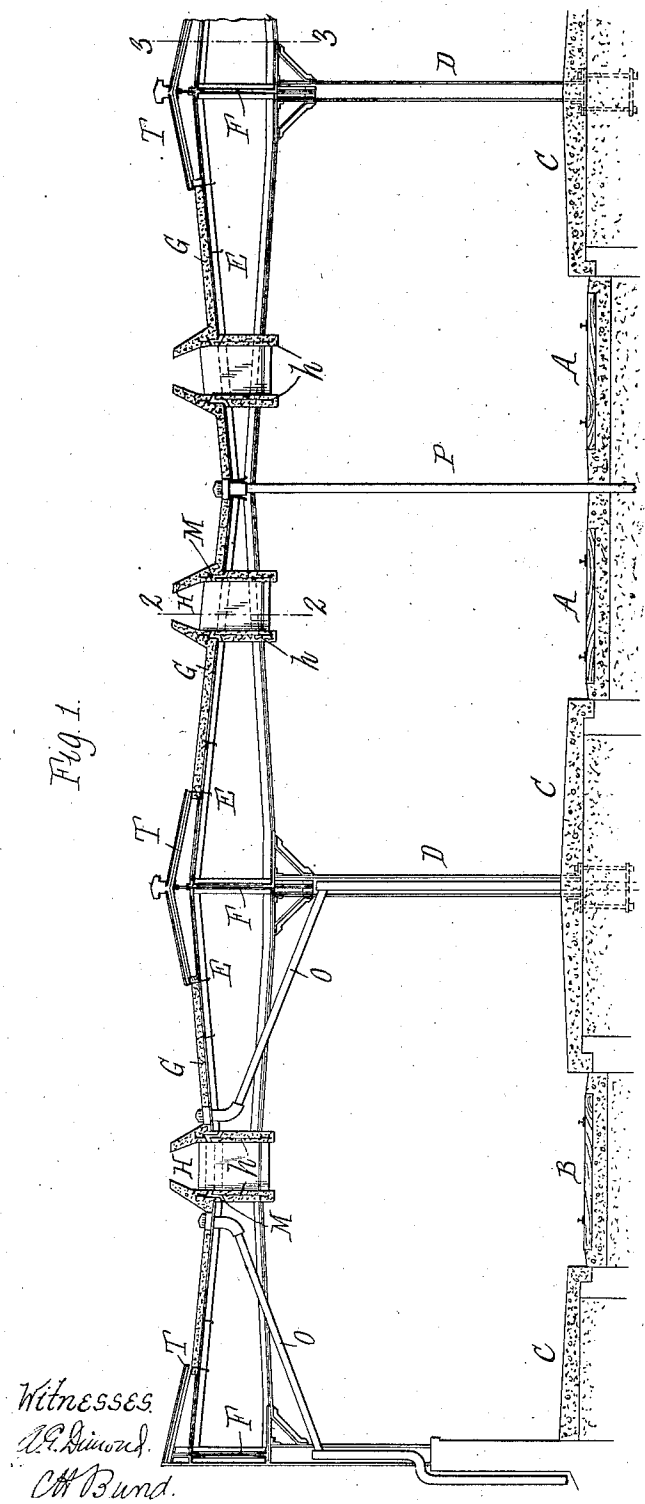
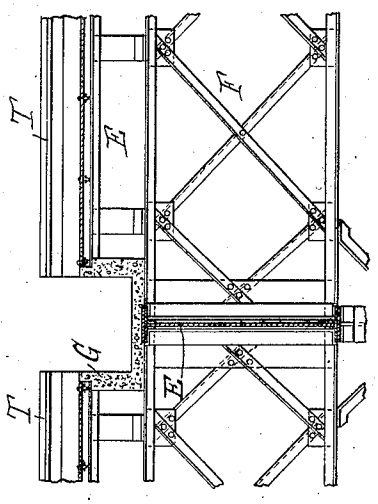


Fig. 1.

Fig. 3.



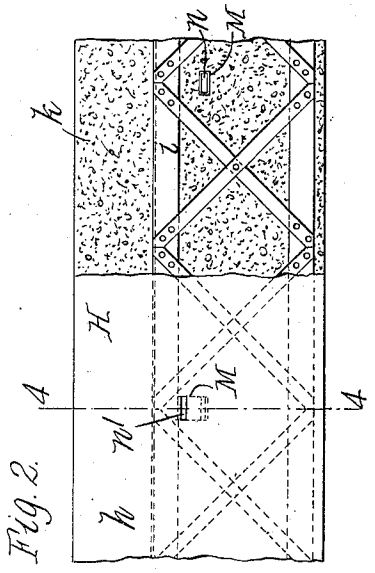


Fig. 2.

Witnesses.
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3 SHEETS—SHEET 2.

Fig. 4.

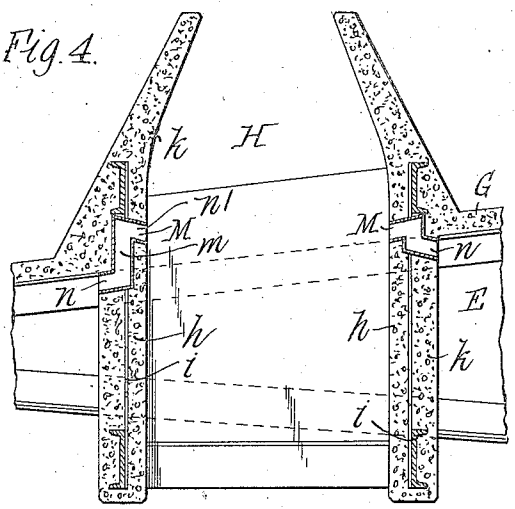


Fig. 7.

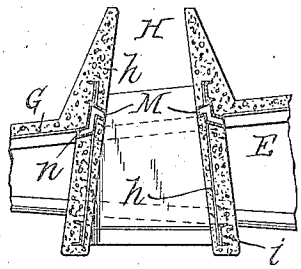
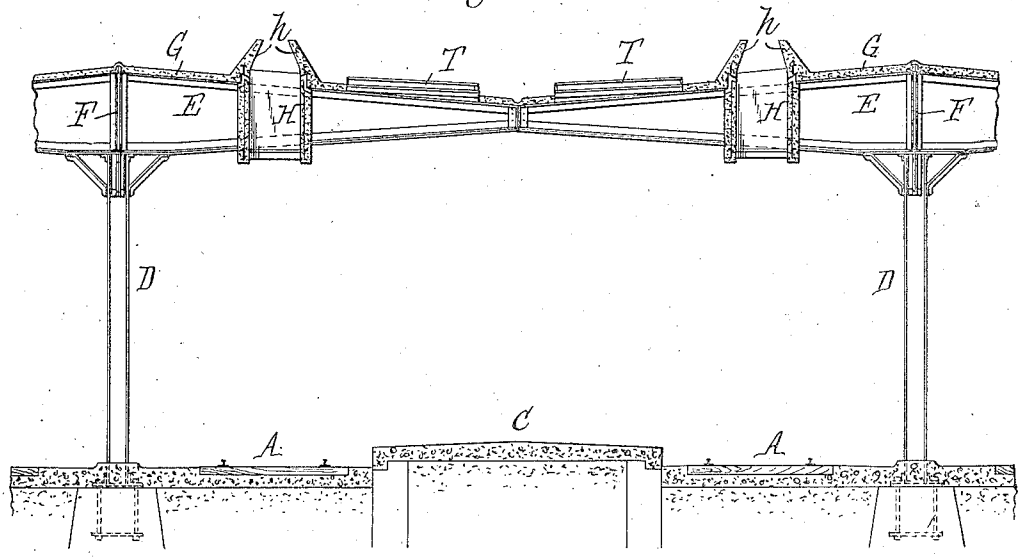


Fig. 5.



Witnesses.

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3 SHEETS—SHEET 3.

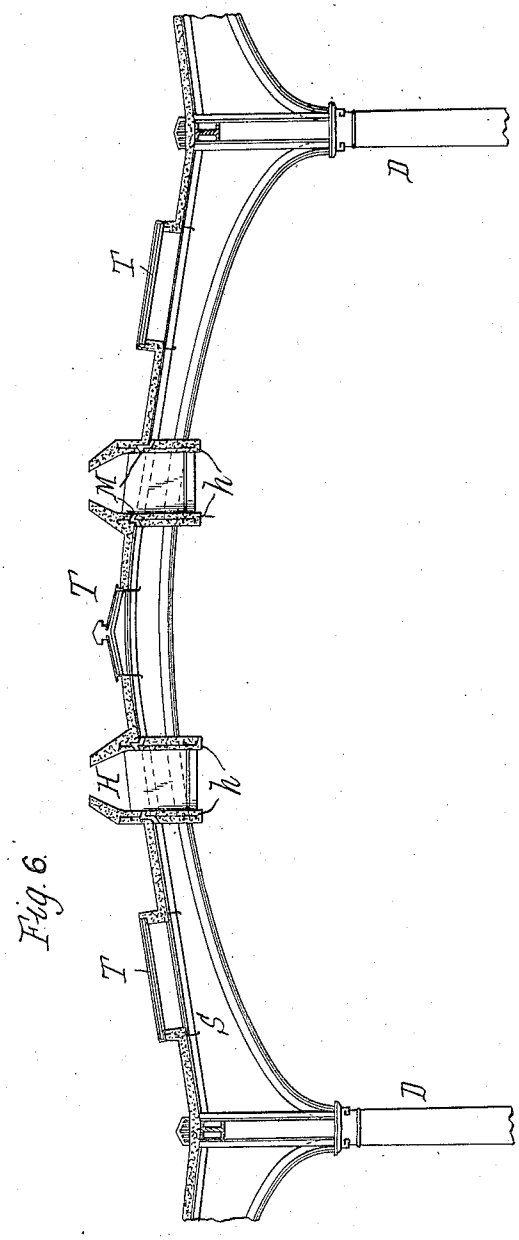


Fig. 6.

Witnesses.
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UNITED STATES PATENT OFFICE.

ABRAHAM L. BUSH, OF EAST ORANGE, NEW JERSEY.

RAILROAD TRAIN-SHED.

1,101,783. Specification of Letters Patent. Patented June 30, 1914.

Application filed November 10, 1910. Serial No. 591,600.

To all whom it may concern:

Be it known that I, ABRAHAM L. BUSH, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Railroad Train-Sheds, of which the following is a specification.

This invention relates to the type of train shed which is disclosed by my Letters Patent No. 855,160, dated May 28, 1907, in which the roof is provided with a duct for the escape of steam, smoke and gases arranged lengthwise over the track.

The objects of this invention are to improve the construction of the smoke duct with a view of preventing the entrance of excessive amounts of snow or rain through the same and to improve the construction of the ventilating duct leading through the wall of the duct from the underside of the roof into the smoke duct with a view of facilitating the escape of steam or gases from underneath the roof, while preventing steam and gases from being forced from the smoke duct through the ventilating duct into the shed by the force of the exhaust.

In the accompanying drawings, consisting of three sheets: Figure 1 is a vertical section of the improved train shed at right angles to the tracks. Figs. 2 and 3 are fragmentary sections at right angles to Fig. 1, on lines 2—2 and 3—3, respectively, on an enlarged scale. Fig. 4 is a cross section of the smoke duct on line 4—4, Fig. 2. Fig. 5 is a vertical section similar to Fig. 1, showing a modified arrangement of the supporting columns. Fig. 6 is a vertical section similar to Fig. 1, showing the improved smoke duct and ventilating duct applied to a shed of the arched construction shown in my said patent. Fig. 7 is a cross section similar to Fig. 4, showing a modified form of the smoke duct.

Like reference characters refer to like parts in the several figures.

In Fig. 1 a shed is represented which contains double tracks A in one portion of the shed and a single track B in another portion. C represents the passenger platforms and D the columns or other roof supports arranged with reference to the tracks in any suitable way. The columns may be arranged on the platforms, as represented in Fig. 1, or between two tracks, as shown in Fig. 5.

Referring to Figs. 1–5, E represents the main rafters or ribs of the roof structure which are arranged transversely to the tracks and supported upon the upright columns or supports D. These rafters are constructed in the manner of cantaliver arms, highest over the supports D and decreasing in height toward the ends of the arms. Their upper sides preferably slope toward their ends and they are connected lengthwise of the tracks by girders F arranged over the columns or supports. The roof or ceiling G, supported on these rafters, slopes from the supports toward the ends of the cantaliver arms, so that the valley of each roof section is arranged between the two lines of supports or columns. H represents the longitudinal smoke duct arranged in the roof lengthwise over each track in the proper position to provide for the free escape of the engine exhaust into the outer air. Each smoke duct is formed between two longitudinal walls or purlins *h* which are supported by the main rafters or ribs. As shown in Figs. 1 and 4, the lower portions of these walls are vertical, while the upper portions are inclined and approach each other upwardly and, as shown in Fig. 7, the walls are inclined throughout, so that the duct is contracted at its upper end by the upwardly converging walls or portions of the walls. In ordinary practice the duct walls are preferably about two feet and six inches apart at their lower ends and one foot and three inches at their upper ends. These proportions provide ample space for the entrance and escape of the exhaust into and from the duct and reduce materially the amount of snow or rain which can enter the duct from above. In localities where the precipitation of rain or snow is excessive and high winds are frequent, this contraction of the duct at its upper end is very advantageous and desirable. The walls of the ducts are preferably each constructed of a built-up steel skeleton *i* and a covering of concrete *k*, which latter, as shown, may form the greater part of the upper inclined portion of the wall. This inclined portion is preferably arranged above the roof or ceiling and the vertical part below the same, as shown. The main rafters or ribs extend preferably through the smoke duct and have the portion which is arranged in the duct protected by a concrete covering, while the intermediate rafters or ribs do not ex-

tend through the ducts and are not so protected. M represents ventilating ducts penetrating the walls of the smoke ducts at suitable intervals for forming escape passages for steam, hot air or gases which may reach the angular space formed by the underside of the ceiling and the outer side of the smoke duct. Each of these passages has its lower end arranged to open in the outer side of the wall of the duct adjacent to the underside of the ceiling, ascends in the wall and has its upper end opening into the smoke duct. Steam, hot air or gases which reach the angle between the underside of the ceiling and the smoke duct escape readily through this ventilating duct and pass into the smoke duct. The upper trend of the ventilating duct facilitates such escape and the changes of direction in the ventilating duct at the junctions of its ascending portion with the outlet and inlet portions offers considerable resistance to the flow of steam or gases in the reverse direction and prevents a powerful exhaust from forcing steam and smoke through this ventilating duct from the smoke duct into the shed. The ventilating passage M may be formed, as shown, by a casting which is embedded in the smoke duct wall and which comprises an upright portion *m*, a lower or inlet portion *n* and an upper or outlet portion *n'*, the inlet and outlet portions projecting in opposite directions from the upright portion, forming an approximately Z-shaped duct or passage. The outlet *n'* preferably slopes downwardly toward the interior of the smoke duct to prevent water which runs down on the inner side of the smoke duct from entering the ventilating duct, and the inlet *n* preferably slopes downwardly toward the outer side of the smoke duct to facilitate the entrance of steam and gases into the vent duct. If preferred, the ventilating duct may be molded in the concrete forming the wall of the smoke duct, in which case a casting forming the ventilating duct is dispensed with. The drain pipes may be arranged in any convenient manner. In the single track portion of the shed, represented in Fig. 1, drain pipes O extend from the valley of the roof on opposite sides of the smoke duct along the side of the cantaliver arms to the supporting columns, while in the double track portion of the shed, shown in the same figure, a drain pipe P extends from the valley between the two smoke ducts directly down between the two tracks.

In Fig. 7 the upwardly converging smoke ducts and the Z-shaped ventilating ducts are represented in connection with an arched roof construction S, such as is represented in my former patent, to which construction these features are applicable as well as to a cantaliver construction. The cantaliver construction can be made somewhat lighter than the arched construction without sacrificing strength or rigidity, and locates the valleys of the roof between the lines of supports instead of over the same, if desired. T represents the sky lights which are arranged in the roof at suitable places. When the rafters or ribs extend through the smoke ducts they operate as wind brakes to break the force of air currents sweeping lengthwise through the ducts. The cantaliver construction described and shown but not claimed herein is claimed in my divisional application filed February 20, 1914, Serial No. 819,979.

I claim as my invention:

1. In a railroad train shed, the combination with a roof having transverse members, of a smoke duct arranged therein lengthwise over the track and having opposing side walls which converge upwardly and are supported by said roof members, substantially as set forth.

2. In a railroad train shed, the combination with a roof, of a smoke duct arranged therein lengthwise over the track and having its side walls composed of lower vertical portions and upper portions which converge upwardly, substantially as set forth.

3. In a railroad train shed, the combination with a roof, of a smoke duct arranged therein lengthwise over the track and having its side walls composed of lower vertical portions which are arranged below the roof and upper portions which are arranged above the roof and converge upwardly, substantially as set forth.

4. In a railroad train shed, the combination with a roof, of a smoke duct arranged therein lengthwise over the track and having opposing side walls which extend below the roof, said side walls being provided with ventilating ducts penetrating said walls in an upward direction and having their lower ends opening outwardly below the roof and their upper ends opening in a downward direction into the duct, substantially as set forth.

Witness my hand this 7th day of November, 1910.

ABRAHAM L. BUSH.

Witnesses:
EDWARD WILHELM,
C. B. HORNBECK.