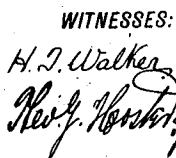


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UNITED STATES PATENT OFFICE.

JOSEPH L. JENSEN, OF RICHFIELD, AND HYRUM DENISON, OF MANTI, UTAH.

STEAM-BOILER.

988,717.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, JOSEPH L. JENSEN, a resident of Richfield, in the county of Sevier and State of Utah, and HYRUM DENISON, a resident of Manti, in the county of Sanpete and State of Utah, both citizens of the United States, have invented a new and Improved Steam-Boiler, of which the following is a full, clear, and exact description.

The invention relates to steam traction engines and similar vehicles, and its object is to provide a new and improved steam boiler arranged to insure at all times proper delivery of dry steam to the engine, whistle or other device, and irrespective of whether the steam boiler is on the level or inclined in either direction on the vehicle going up or down a hill.

For the purpose mentioned, use is made of steam domes at the forward and rear ends of the boiler, a steam delivery pipe having its ends extending into the said domes, and float-controlled steam inlet valves for the ends of the said pipe, the floats being controlled by the water rising and falling in the said domes.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a longitudinal central section of the improved steam boiler as applied to a traction engine going up a hill; Fig. 2 is an enlarged sectional side elevation of the forward dome and the valve connection for the steam delivery pipe; and Fig. 3 is a plan view of the same, the dome being shown in section.

The shell A of the boiler is mounted in the usual manner on suitable wheels B, and within the shell A is arranged a fire box C connected by flues C' with the smoke box D having the usual stack E. The crown sheet C² of the fire box C is inclined in the direction of the length of the boiler, preferably inclined forwardly and upwardly, as

plainly indicated in Fig. 1, so that when the traction engine or other vehicle travels down a hill the lowermost portion of the crown sheet C² is still under water and hence the crown sheet is not liable to become overheated.

On the forward and rear ends of the shell A are arranged steam domes F, F', into which extend the ends G', G² of a steam delivery pipe G extending lengthwise within the shell A, which latter is provided with openings A', A² at the bottoms of the domes to allow the steam generated in the shell A to pass into the domes F, F'. The ends G, G' of the delivery pipe G are provided with nipples H, H', passing through the walls of the domes F, F' to the outside thereof. One of the nipples, as shown the nipple H, is closed by a cap H² and the other is connected by a pipe H³ with the engine of the vehicle and with a whistle I, as shown in Fig. 1. It is understood that the nipple H or H' which is nearest the engine steam chest is connected with the same. On the upper ends G', G² of the steam delivery pipe G are arranged valve casings J, J', preferably bolted or otherwise fastened to the inside of the domes F, F', and the said valve casings J, J' are provided with valve seats J², J³ having their outer faces in segmental shape engaged by correspondingly-shaped valves K, K' mounted on levers K², K³, fulcrumed on the valve casings J, J', respectively. The levers K², K³ are pivotally connected by links L, L' with the stems N², N³ of floats N, N' contained within the steam domes F, F' and rising and falling with the water passing into the steam domes F, F' through openings A', A² formed in the shell A of the boiler. The stems N², N³ of the floats N, N' are mounted to slide in suitable guideways N⁴, N⁵ arranged on the domes F, F', and the shell A of the boiler, as plainly indicated in Fig. 1.

When the vehicle travels on the level ground the water level within the shell A is below the domes F, F', and consequently no

water is contained in the said domes, and the floats N, N' are consequently in a lowermost position, so that the valves K, K' are held off the seats J², J³ to allow the steam 5 generated in the shell A and passing by way of the openings A', A² into the domes F, F' to flow from the latter through the open valve seats J², J³ into the valve casings J, J' and into the pipe G, from which the steam 10 can pass by way of the pipe H³ to the engine, and the steam can also sound the whistle I whenever the whistle is intended to be sounded in the usual manner.

When the vehicle travels up a hill, as indicated in Fig. 1, then the water in the shell A flows through the rear end thereof and passes through the openings A² into the dome F', whereby the float N' is moved upward, and in doing so it moves the valve K' 20 over the seat J³ to close the same, thus shutting off the steam contained in the dome F' from the pipe G. As the steam dome F is free of water at this time, the valve K remains open and consequently the steam generated in the shell A passes by way of the openings A' into the dome F and through the open valve seat J², casing J and end G' 25 into the steam delivery pipe G to supply the engine with the necessary dry steam. When the vehicle travels down a hill the water in the shell A flows to the front end thereof and passes by way of the openings A' into the steam dome F to lift the float N and cause the valve K to move into a closed 35 position on the valve seat J², thus shutting off the end G' from the interior of the dome F. At this time the dome F' is free of water, and its float N is in a lowermost position, consequently, the valve K' is open so that the steam generated in the shell A can flow by way of the openings A² into the steam dome F' and through the open valve seat J³ into the valve casing J' and by way of the pipe end G² into the pipe G to supply 45 the engine with dry steam.

In case any one of the float-controlled mechanisms in the steam domes F and F' should get out of order, the corresponding valve seat J² or J³ may be closed by manually-controlled valves O, O' adapted to engage the inner faces of the valve seats and extending to the outside of the domes F, F' to within convenient reach of the operator. 50

A small drain pipe P is connected with the steam delivery pipe G and extends through the rear end of the shell A, and on the outer end of the drain pipe P is arranged a drain cock P' which when opened drains the water of condensation from the 60 pipe G, thus relieving the pipe G of all water of condensation.

The domes F, F' are provided with suit-

able hand holes F², F³ to permit access to the interior of the domes and the parts contained therein, for repairing or other purposes. 65

By the arrangement described, the engine of the vehicle can be readily supplied at all times with dry steam, irrespective of whether the vehicle travels on a level or up 70 or down a hill.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. A steam boiler provided at its ends 75 with domes, a steam delivery pipe having its ends extending in the said domes, valves controlling the ends of the said pipe, and floats rising and falling with the water in the said domes and connected with the said valves 80 to open and close the same.

2. A steam boiler provided at its ends with domes, a steam delivery pipe having its ends extending in the said domes, valve casings on the said pipe ends and having 85 valve seats opening into the domes, lever valves for closing and opening the said valve seats, and floats rising and falling with the water in the said domes and connected with the said lever valves. 90

3. A steam boiler provided at its ends with domes, a steam delivery pipe having its ends extending in the said domes, valve casings on the said pipe ends and having 95 valve seats opening into the domes, lever valves for closing and opening the said valve seats, floats rising and falling with the water in the said domes and connected with the said lever valves, and manually-controlled valves for opening and closing the said 100 valve seats within the said valve casings.

4. A steam boiler provided at its ends with domes communicating therewith, a steam delivery pipe extending lengthwise of the boiler and having its ends extending into 105 the domes, valve casings on the ends of the said pipes and having valve seats, the outer faces of which are segmental, levers fulcrumed on the valve casings and having segmental valves engaging the said seats, floats 110 in the domes and connected with the said valve carrying levers, and manually controlled valves adapted to engage the inner faces of the valve seats.

5. A steam boiler provided at its ends 115 with domes, a steam delivery pipe having its ends extending in the said domes, valve casings on the said pipe ends and having valve seats, the outer faces of which are segmental, lever valves fulcrumed on the 120 said valve casings, engaging the said segmental seats to open and close the same, floats within the said domes and rising and falling with the water in the said domes.

and connections between the said floats and the said lever valves.

6. In a steam boiler, a dome upon the boiler and communicating therewith, a steam
5 pipe extending from the boiler into the dome, a valve casing on the end of the steam pipe within the dome and having a segmental valve seat, a lever fulcrumed on the casing and having a segmental valve, a float
10 having guided movement in the dome, and a link connecting the float and lever.

In testimony whereof we have signed our

names to this specification in the presence of subscribing witnesses.

JOSEPH L. JENSEN.

HYRUM DENISON.

Witnesses to the signature of Joseph L. Jensen:

VIOLA BURR,

JENNIE JORGENSEN.

Witnesses to the signature of Hyrum Denison:

JAMES FROST,

SAMUEL DAVENPORT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
