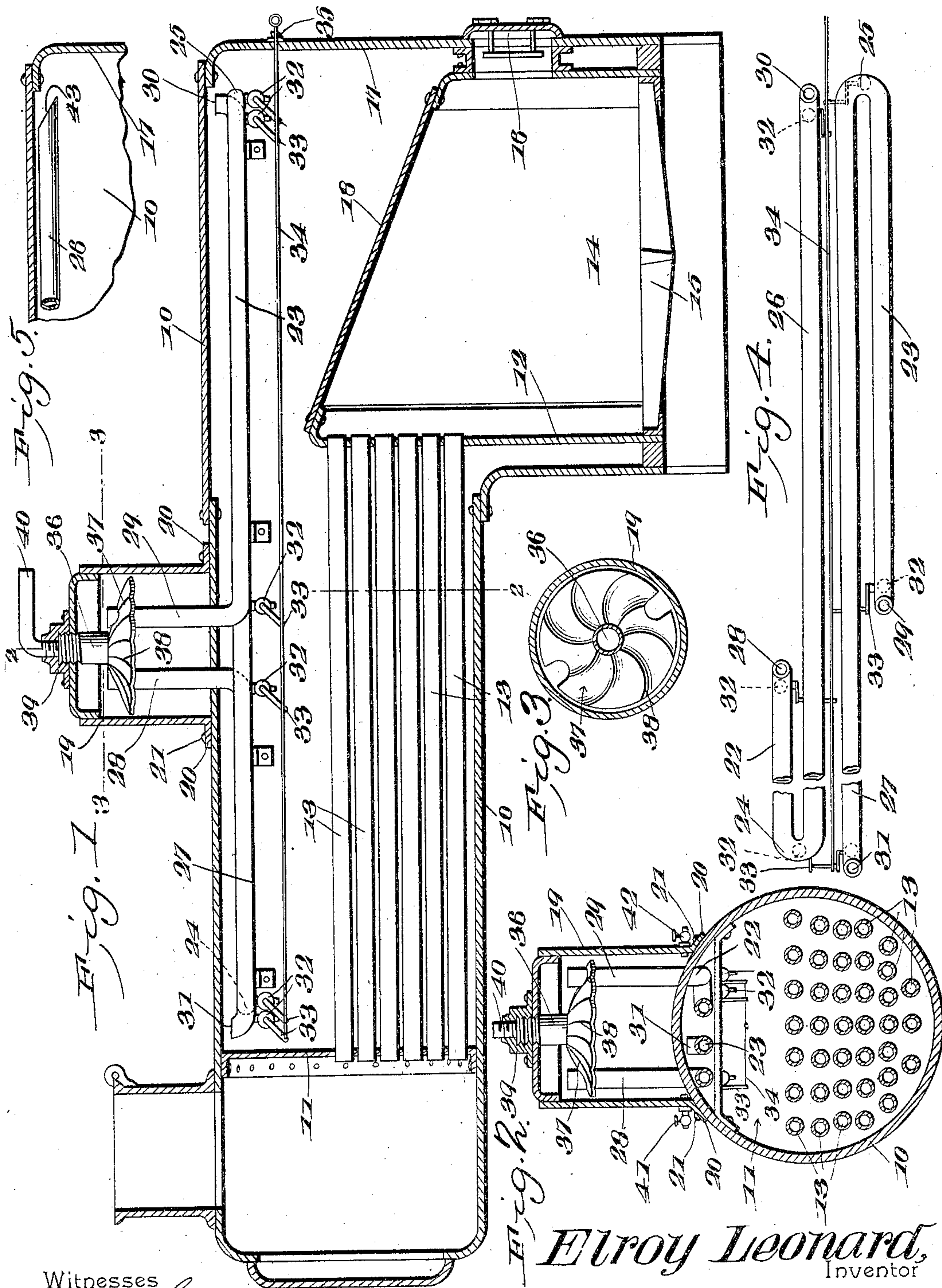


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PATENTED MAY 16, 1905.

E. LEONARD.
TRACTION ENGINE BOILER.
APPLICATION FILED OCT. 29, 1904.



Witnesses

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UNITED STATES PATENT OFFICE.

ELROY LEONARD, OF LENOX, WEST VIRGINIA.

TRACTION-ENGINE BOILER.

SPECIFICATION forming part of Letters Patent No. 789,861, dated May 16, 1905.

Application filed October 29, 1904. Serial No. 230,541.

To all whom it may concern:

Be it known that I, ELROY LEONARD, a citizen of the United States, residing at Lenox, in the county of Preston and State of West Virginia, have invented a new and useful Traction-Engine Boiler, of which the following is a specification.

This invention relates to steam-boilers, more particularly to the boilers of traction-engines and similar portable structures, and has for its object to provide an efficient and simply-constructed device, whereby the engine may be run over very steep grades without causing the water in the boiler to overflow into the steam feed-pipes and thence to the engine-cylinders.

Another object of the invention is to provide a structure wherein the steam is supplied to the engine at an increased degree of dryness without increasing the amount of fuel consumed.

With these and other objects in view, which will appear as the nature of the invention is better understood, the same consists in certain novel features of construction, as hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which corresponding parts are denoted by like designating characters, is illustrated the preferred form of embodiment of the invention capable of carrying the same into practical operation, it being understood that the invention is not necessarily limited thereto, as various changes in the shape, proportions, and general assemblage of the parts may be resorted to without departing from the principle of the invention or sacrificing any of its advantages.

In the drawings thus employed, Figure 1 is a longitudinal sectional elevation of a steam-boiler with the improvements embodied therein. Fig. 2 is a transverse section on the line 2-2 of Fig. 1. Fig. 3 is a transverse section of the steam-dome on the line 3-3 of Fig. 1. Fig. 4 is a plan view of the improved dry-pipes detached. Fig. 5 is a sectional detail illustrating a modification in the construction.

In the drawings illustrative of the invention is shown a conventional form of boiler employed in connection with traction-engines,

in which the shell 10, flue-sheets 11 and 12, flues 13, fire-box 14, grate 15, fire-door 16, and front sheet 17 are of the ordinary form and with the crown-sheet 18 inclined to an increased degree to enable the boiler to traverse 55 a steeper grade without uncovering the crown-sheet than is possible with boilers of this class as ordinarily constructed. The steam-dome 19 is not in direct communication with the interior of the boiler, but is secured to one of 60 the plates of the boiler by the usual flange 20 and rivets 21.

Arranged within the upper part of the boiler are two approximately U-shaped pipes 22 and 23, having bends 24 25, respectively, 65 one being disposed adjacent to the flue-sheet 11 at the smoke-stack end of the boiler and the other near the front or fire-box end of the boiler. The leg 26 of the pipe 22 terminates near the front sheet 17, and the corresponding 70 leg 27 of the pipe 23 is extended to a point near the flue-sheet 11. The other legs 28 and 29 of the pipes are extended through openings in the shell 10 and terminate near the top of the dome 19. The terminals of the 75 legs 26 27 may be bent upward, as shown at 30 31, so that steam can enter only from above and at the highest possible point within the boiler.

On the pipes 22 and 23 are arranged drainage-valves 32, having stems 33, that are all 80 connected to a rod 34. This rod leads out through a stuffing-box 35 in the front sheet 17 and is provided with an operating-handle within convenient reach of the attendant. 85

At the top of the dome is a short pipe 36, to the lower end of which is secured a conical disk 37, provided on its upper face with a plurality of radiating channels 38. The rim of the disk is extended close to the inner wall of 90 the dome and is provided with notches for the reception of the upper ends of the portions 28 and 29 of the pipes. The upper end of the pipe 36 is secured to a collar 39, carried by the dome, and to said collar is also connected 95 the feed-pipe 40, leading to the engine.

As steam is generated in the boiler it passes indirectly to the dome through the pipes 22 and 23 and in its passage is compelled to 100 traverse the whole length of the boiler and

half the distance back again in each pipe and thence to the top of the dome before it escapes. This is found to effectually dry the steam, and its temperature is considerably greater than if the steam were allowed to pass directly from the boiler to the dome. Any water of condensation precipitated in the upper portion of the dome will be deflected by the disk 37 to a point adjacent to the inner wall of the dome and will thence fall to the shell of the boiler. This water may be drawn off from time to time through drainage-cocks 41 and 42. The arrangement of the pipes is such that water from the boiler cannot enter the vertical portions 28 and 29 of said pipes even if the boiler were tilted up on end, and by duplicating the pipes—that is, by providing one for the passage of steam from each end of the boiler—the engine may ascend or descend very steep grades without danger of water passing into the dome. In some cases the ends of the pipes may be cut away on inclined lines, as indicated at 43 in Fig. 5, thus permitting the placing of the pipe closer to the shell of the boiler. This structure, moreover, renders unnecessary the employment of the auxiliary drainage-valves 32, the pipes being self-draining.

Having thus described the invention, what is claimed is—

1. A boiler having a steam-dome provided with a closed bottom to prevent direct communication with the boiler, in combination with a pipe having a bend disposed at one end of the boiler, one arm of the pipe being extended to a position adjacent to the opposite end of the boiler, and the other arm of said pipe extending into the steam-dome.

2. A boiler having a steam-dome provided with a closed bottom to prevent direct communication with the boiler, in combination with one or more U-shaped pipes disposed within the upper portion of the boiler, with the bend of each pipe near one end of the boiler, and one arm extended to a point near the opposite end of the boiler, and the other arm extended into said dome.

3. The combination with a boiler having a steam-dome, of one or more U-shaped pipes disposed within the upper portion of the shell of the boiler, the bend of each pipe being near

one end of said shell, and the two arms of each pipe extending one to the opposite end of the shell and the other to a point within the dome.

4. The combination with a boiler having a steam-dome provided with a closed bottom to prevent direct communication with the boiler, of a pipe disposed within the upper portion of the shell of the boiler, one end of the pipe being disposed adjacent to the end of the boiler, and the opposite end extending into the steam-dome, and drainage-cocks disposed on said pipes.

5. A boiler having a steam-dome, a deflecting-disk arranged near the upper portion of the same, and one or more U-shaped pipes disposed within the upper portion of the shell of the boiler with the bend of each pipe near one end of the shell, and one arm extending to the other end of the shell, and the other arm extended into the dome and terminating above said deflecting-disk.

6. The combination with a boiler having a steam-dome, of a deflector-disk disposed near the upper portion thereof and provided with a convex upper surface having radial channels, and one or more pipes disposed within the upper portion of the shell of the boiler and extending nearly to the ends of the same, said pipes also extending into the dome and terminating above the deflector-disk.

7. The combination with a boiler, of a steam-dome having a closed bottom for preventing direct communication between the boiler and the dome, a deflector-disk disposed within the dome and provided with a convex upper surface, a steam-outlet pipe extending through said disk and supporting the same, and one or more U-shaped pipes arranged within the upper portion of the shell of the boiler with the bend of each pipe near one end of the shell, and with one arm extended to the other end of the shell, and the other arm extended into said dome and terminating above said deflector-disk.

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

ELROY LEONARD.

Witnesses:

JOHN MARTIN,
W. E. COLE.