(No Model.)

F. WILD.

UPRIGHT BOILER.

No. 453,766. Patented June 9, 1891.

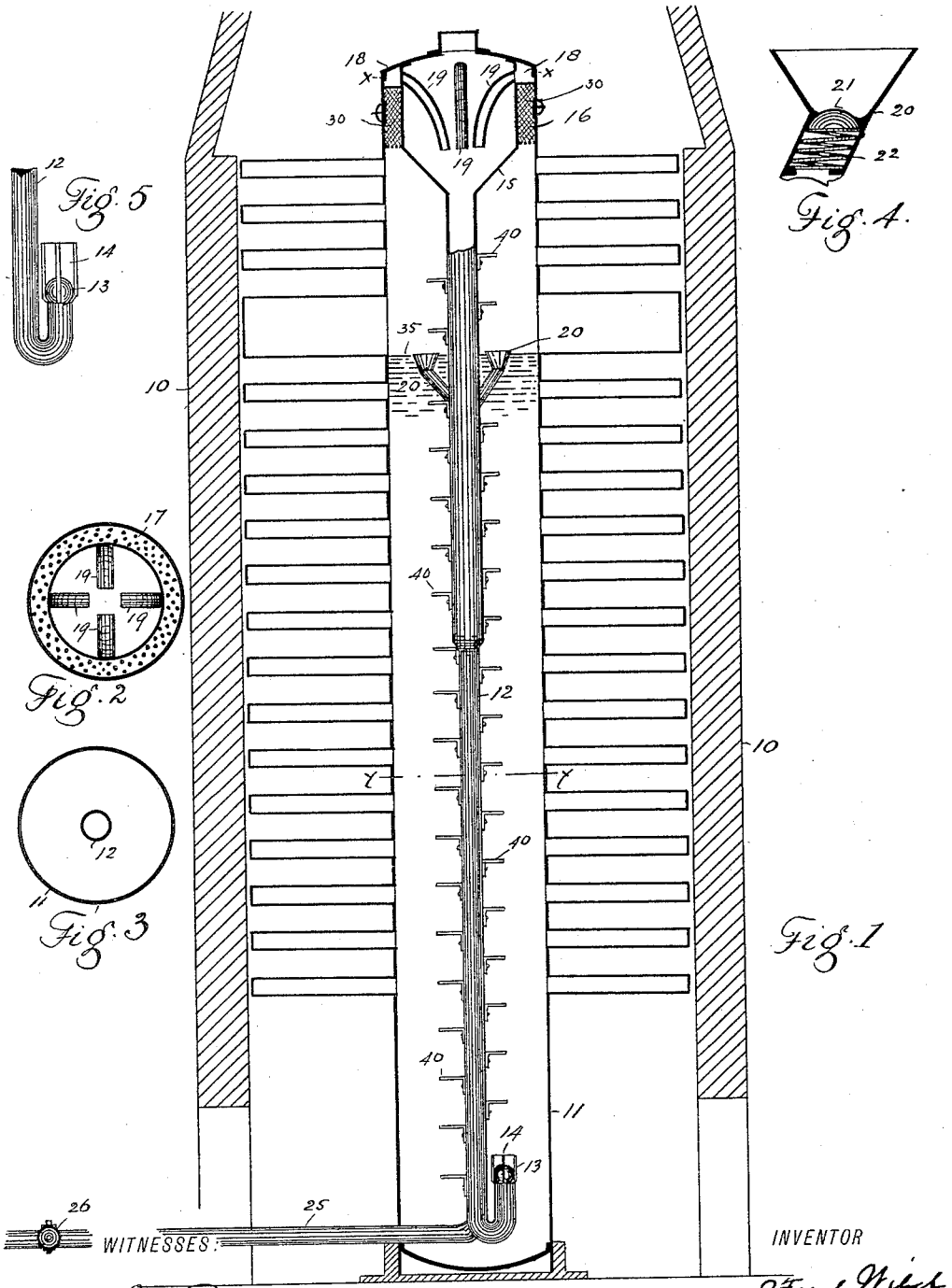

Fig. 1

Fig. 4.

Fig. 5

Fig. 2

Fig. 3

WITNESSES:

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UPRIGHT BOILER.

SPECIFICATION forming part of Letters Patent No. 453,766, dated June 9, 1891.

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To all whom it may concern:

Be it known that I, FRED WILD, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Upright Boilers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in upright boilers; and its object is to prevent the water from boiling up and passing into the steam-pipe leading to the engine, and therefore designed to prevent the injurious results necessarily following or attending the presence of any considerable quantity of water in this pipe. The means heretofore employed to accomplish this object have been very crude and imperfect so far as known to me, and have signally failed in attaining the result sought.

It is believed that my improved device will remedy the evil mentioned, and thus it is thoroughly practicable in use as well as reliable and durable in operation.

The device is also simple in construction, economical in cost, easily attached to the boiler, and consists of the features hereinafter set forth and claimed.

The device will be fully understood by reference to the accompanying drawings, wherein is illustrated an embodiment of the invention.

In the drawings, Figure 1 is a vertical longitudinal section of an upright boiler provided with my improved attachment. Fig. 2 is a plan view with the cap of the tank removed, or a transverse section taken on the line *x x*, Fig. 1. Fig. 3 is a similar section taken on the line *y y*, Fig. 1. Fig. 4 is a vertical section taken through one of the surface blow-off pipes. Fig. 5 is an enlarged elevation of the lower portion of a vertical pipe located in the center of the tank.

In the views, wherein similar reference-characters indicate corresponding parts of the mechanism, let the numeral 10 designate the walls of an upright boiler; 11, the tank provided with the tubular arms surrounding the same and extending into the space lying between the tank proper and the boiler. In the center of the tank is located a pipe 12, which is turned up at the bottom and provided with a ball-valve 13, having the extremity of the pipe for its seat, and surrounded by a basket, screen, or grate 14 in the usual way to retain the valve in its place when raised from its seat. The upper portion 15 of pipe 12 is funnel-shaped and enlarged, as shown in Fig. 1. A portion 16 of the space between this enlarged upper portion of the pipe and the shell of the tank is closed at the top and bottom by a circumferential screen or foraminated plate 17. Between these two perforated plates is placed a porous filling 30, which may consist of wire-cloth of suitable mesh or any suitable filling composed of metal or other material adapted to endure the heat and vaporize the water mingled with the steam in the form of globules or bubbles and carried to contact therewith.

Opening downward from a small space 18 between space 16 and the top of the tank are outlet tubes or pipes 19, adapted to discharge into the funnel-shaped top portion of pipe 12.

Let the numeral 35 designate the normal water-level in the tank. Now if the water boils up or rises in the form of foam into the top of the water-tank it is forced through the perforated plate or screen 17, which, with filling 30, breaks up or vaporizes its globules or bubbles. When, however, it rises in considerable quantities or volumes, it passes to space 18, and thence through pipes or tubes 19 into the enlarged funnel-shaped portion of the pipe 12, and if not allowed to escape would soon fill the pipe. It results, however, that as soon as the water reaches the same level in the pipe 12 that it is in the surrounding tank this level is maintained, since as the water passes, as just described, from the tank into the top of the pipe the increased height of the column of water in the pipe causes the valve 13 to rise and permit the water in pipe 12 to escape until the level is the same in both pipe and tank. It will thus be seen that the water in pipe 12 will not remain higher than the level in the surrounding tank and that pipe 12 affords an escape back into the tank

for water rising into the top thereof, and which might otherwise pass into the steam-pipe. It will also be observed that since the pipe 12 is located in the center of the tank it is protected from the excessive heat action on the shell thereof, thus affording a receptacle for the water discharged thereinto when the water is maintained at a temperature sufficiently low to prevent its being carried up into the steam-pipe.

Let the numeral 20 designate the surface blow-off pipes opening into pipe 12 at one extremity and provided with funnel-shaped mouth at the opposite extremity, said mouth terminating slightly above the surface of the water. Each of these blow-off pipes is provided with a valve 21, which is held in place against a suitable seat by a coil-spring 22, engaging the valve at one extremity, and a circumferential flange formed on the interior of the pipe at the opposite extremity.

Communicating with pipe 12 at the bottom is a discharge-pipe 25, carried outside the boiler, where it is provided with a globe-valve 26. Now when it is desired to remove the water from pipe 12 valve 26 is opened and the pressure of the steam above the water in the tank will open valves 21 and force the contents of the pipe 12 out through discharge-pipe 25, valve 13 being kept closed by the weight of the water above in the tank.

Pipe 12 is provided with steps 40, projecting therefrom in horizontal planes or at right angles to its vertical column. These steps form a ladder whereby a person may readily climb from the bottom to the top of the tank whenever it may be necessary or desirable to do so.

Having thus described my invention, what I claim is—

1. In an upright boiler, the combination, with the tank, of a pipe 12 located therein and extending from a point above the water-level to a point beneath the surface, its lower extremity being turned upward and closed by a ball-valve and its upper extremity provided with openings, whereby water rising to the top of the tank is discharged into the pipe 12 and passes out through the opening at its lower extremity until the water-level in the pipe is the same as that in the surrounding tank, substantially as described.

2. In an upright boiler, the combination, with the tank, of a pipe 12, centrally located therein and extending from below the surface of the water to a suitable point above the same, the lower extremity being open, turned upward, and provided with a ball-valve normally balanced and seated upon the extremity of the pipe, the upper extremity being provided with an inlet, whereby water rising into the upper portion of the tank above the normal water-level may pass into this pipe and out through its lower extremity until the normal level in the pipe and tank are the same, substantially as described.

3. In an upright boiler, the combination, with the tank, of a pipe located therein and extending both above and below the normal water-level, the lower extremity of the pipe being provided with a trap having its short vertical arm provided with a suitable valve, the space between the upper portion of the pipe and the shell of the tank being provided with porous filling, which when heated is adapted to break up or vaporize the globules or bubbles of water rising with the steam, and a suitable inlet from the tank to the upper extremity of the pipe, substantially as and for the purpose set forth.

4. In an upright boiler, the combination, with the tank, of a pipe 12 located therein and extending both above and below the normal water-level, the upper extremity being provided with an inlet from the tank, one or more surface blow-off pipes 20, communicating at one extremity with the main pipe and at the opposite extremity rising to the surface of the water or slightly above and normally closed by a suitable valve, and a discharge-pipe leading from the lower extremity of pipe 12 to a suitable point outside the boiler, where it is provided with a globe-valve or its equivalent, whereby as soon as the last-named valve is open the pressure of the steam opens the valves in pipes 20 and forces the contents of pipe 12 out through the discharge-pipe, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRED WILD.

Witnesses:
WM. MCCONNELL,
J. B. WILLSEA.