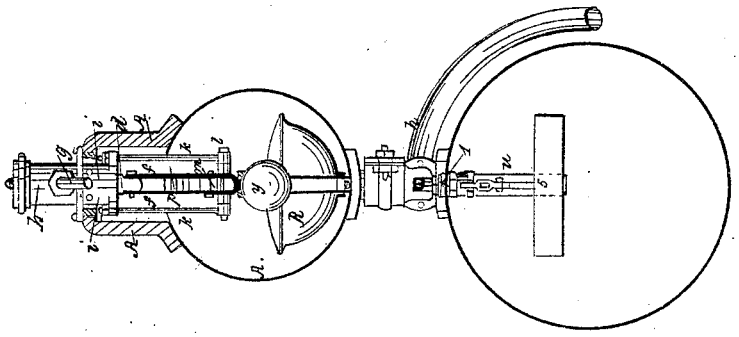
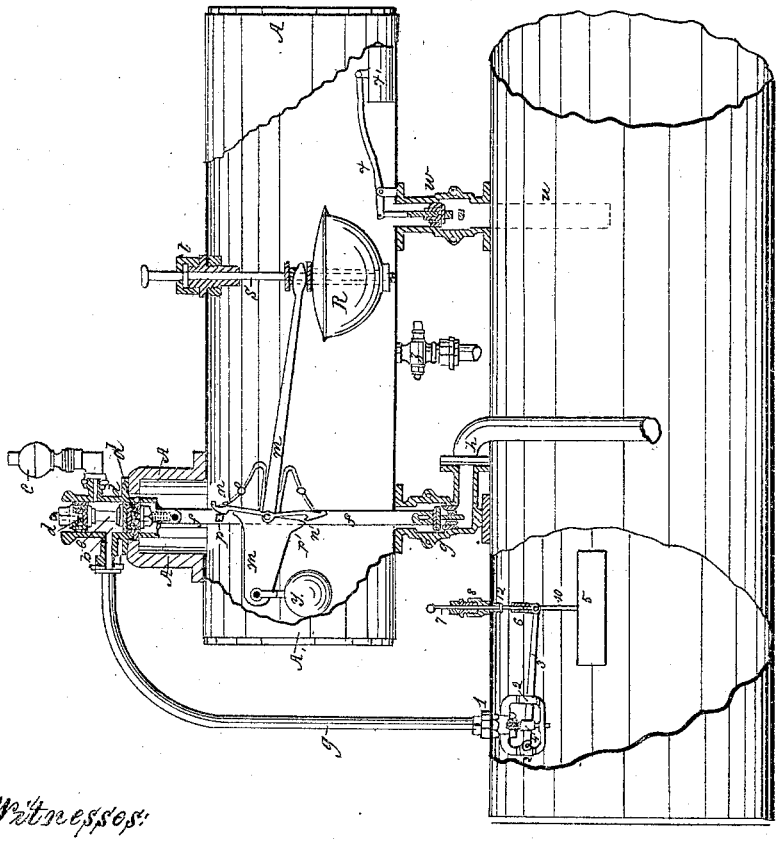
J. Hampson,

Steam-Boiler Feeder,

No. 2,244, Patented Sep. 4, 1841.





Witnesses:

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Inventor:

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UNITED STATES PATENT OFFICE.

JOHN HAMPSON, OF NEW ORLEANS, LOUISIANA.

SELF-ACTING APPARATUS FOR SUPPLYING BOILERS OF STEAM-ENGINES WITH WATER.

Specification of Letters Patent No. 2,244, dated September 4, 1841.

To all whom it may concern:

Be it known that I, JOHN HAMPSON, of the city of New Orleans and State of Louisiana, have invented a new and useful apparatus for supplying steam-boilers with water and for giving an alarm when the water in steam-boilers is low and which I denominate "Hampson's self-acting steam-boiler feeder and water-alarm;" and I do hereby declare that the following is a full and exact description thereof.

My invention consists of a self acting steam boiler feeder and water alarm, suitable for all pressures above that of the atmosphere, and which acts independent of the engine, or any other power than that derived directly from the rise and fall of the water in the boiler or boilers, the pressure of the steam, and the pressure of the atmosphere.

To enable others skilled in the art to make and use my invention I will proceed to describe its position, construction, and operation.

In the upper and any convenient part of a boiler of any ordinary construction, I fasten steam tight a metal tube or valve seat 1 (see drawing in which similar references are on similar parts) on the lower part of which is fitted and secured by a nut, a metal frame 2, 2. This frame is the fulcrum and guide for a lever, 3, and also a guide for the lower end of a valve, 4, the lever is of the second order and is attached to the valve at about 1½ inches from the fulcrum, to the power end of the lever a float, 5, is attached by means of a rod, 10, which is of a length so as to open the valve when the water gets low in the boiler, to the same power end of the lever and pointing upward a socket 6, is jointed; one end of a small rod, 7, is inserted loosely in this socket the other end passes through a stuffing box, 8, to the outside of the boiler, there is a collar, 12, on this rod which is made to strike the stuffing box 8, before it is entirely drawn out of the socket 6, by means of this rod, the valve 4, can be opened from the outside, but it cannot be closed, except by putting water in the boiler. The valve, 4, need not be over one square inch in area, for a very large boiler, and the lever 3, may have a power of twelve times and still be compartively small, with these dimensions the weight of the float 5, need not to exceed 20 lbs. It will then, when the water in the boiler gets low, open the valve with a power of 240 lbs. which, as the valve is but one square inch in area, will be ample in all ordinary cases, and to guard against the possibility of the valve "sticking" the rod 7, is provided so that the person in charge may try it from time to time; from the upper and outer end of the tube or valve seat 1, a pipe 9, leads to a cylinder *b* of about three inches internal diameter, and nine inches in length, it is bored out as true as possible and is left open at both ends, about three inches from the lower end of this cylinder, there is a flange for the purpose of attaching it steam tight, to a steam tight cistern or reservoir, A, A, A, A, (placed above the boiler and of any convenient shape and size,) in such a manner, that about 2½ inches of it (the cylinder) may project down into the said cistern or reservoir; about two inches from the lower end of said cylinder there is one or more apertures, *i*, *i*, for the exit of steam, these apertures open into the cistern or reservoir; at the same distance from the upper end, there is another aperture, which opens into a whistle or alarm C, attached thereto, in the cylinder there is fitted two well ground metal packed pistons *d*, *d*, connected together by a rod *e*, at such a distance apart that when moved down to the lower limit of their movement, the steam which may be admitted into the cylinder through the pipe, 9, will pass through the lower apertures *i*, *i*, of exit into the cistern or reservoir, and when they are moved up, the said lower apertures will be closed and the steam will pass into the whistle or alarm, C.

To the lower piston is attached two bars *f*, *f*, which also are attached by their lower ends to an ordinary valve, *g*, which closes a water pipe, *h*, one end of which is placed in the bottom of the cistern or reservoir immediately under the cylinder the other end leads to the supply of water, this valve *g* is about half the area of the pistons, or so much less, that the pressure of the steam or atmosphere will have so much more power on the pistons than the valve as will overcome the weight and friction of the said pistons, bars and valve, and thereby open or shut the valve, as the case may be. Here I will observe that the supply of water must not be below the reservoir more than the

height to which the pressure of the atmosphere will force water into a vacuum, made by the condensation of steam.

Fastened to the lower end of the cylinders are two bars or hangers, *k*, *k*, of such a length as will extend down to near the center of the cistern or reservoir the lower end of these bars are perforated so as to receive and support a bolt, *l*. This bolt also passes through and is a guide for the bars *f*, *f*, which have an oblong opening in them, of such a length as will allow them to move up or down, the distance that is required for the movement of the piston, this bolt is also the fulcrum for a lever *m*, *m*, which is placed between the said bars *f f*, this lever is shaped somewhat like a cross hilted sword, the center of motion being at the junction of the blade and hilt. The said cross or hilt extends about 3½ inches each side of said center. On the bolt or fulcrum also is jointed two hook catches or pawls, *n*, *n*, one being up and the other down and shaped like the catch of a common latch, with the end of the shank forked so as to clasp or embrace the lever. They also work in between the two bars, *f*, *f*, and are kept up against the cross or hilt of the lever by springs, *o*, *o*. The catch parts project over and leave a space between them and the ends of the cross or hilt of the lever of about a half an inch, between the said bars *f f* and fastened in them are two studs or pins, *p*, *p*, of a distance apart equal to the space between the two catches, added to that of the motion of the pistons these studs or pins are placed equidistant on each side the oblong opening, and are for the catches to hook on. They likewise stiffen the bars *f*, *f;* the long end of the lever, *m*, *m*, is forked so as to embrace a collar attached to a float, R, this float has a hole through the center of it so as to allow it to slide up and down on a rod, S, this rod is secured and supported in the cistern or reservoir, by a socket and nut, *t*, on the lower end of this rod there is a nut for the purpose of lifting the float and lever up, when it may be requisite to liberate the lower catch, *n'*, which would be the case, if the pistons were up and the reservoir was full of air; from the bottom of the cistern or reservoir, a pipe, *u*, leads down into the water of the boiler, in this pipe there is a valve, *w*, which opens toward the interior of the boiler, attached to the stem of this valve, *w*, there is a small lever and float, *a*, *a*, for the purpose of insuring the opening and shutting of the said valve.

Attached to the short end of the lever *m*, *m*, there is a counterbalance *y* equal to half the atmospheric weight of the float, R, that is the weight of the counterbalance, multiplied by the short arm of the lever, will only be half the weight of the float multiplied by the long arm of the lever.

In the lower part of the cistern or reservoir I place a cock, *z*, for discharging air or water when necessary.

The operation and manner of action is as follows when the water gets low in the boiler or boilers the float, 5, opens the valve, 4, the steam passes through the pipe 9, into the cylinder *b*, from whence it passes through the apertures *i*, *i*, into the cistern or reservoir, in which the pressure soon becomes sufficient to force up the piston, which cuts off the further passage of steam into the cistern or reservoir, and opens the passage into the whistle or alarm. The pistons carry up the two bars *f*, *f*, which brings the lever stud or pin, *p*, into the lower catch, *n*, which prevents the pistons from moving down until the right time, the valve, *g*, is opened at the same time, when the steam and air that is in the cistern or reservoirs rushes out through the supply pipe, *h*, into the water, in a very few moments a vacuum is formed in the cistern, or reservoirs, when it is filled with water from the supply, by the pressure of the atmosphere, the water going into the cistern or reservoir causes the float R to rise, when the counterbalance *y*, moves the lever *m*, *m*, the lower end of the cross or hilt of which liberates the lower pin or stud *p'*, from the lower catch *n'* the pressure of the atmosphere now forces the piston down, the upper catch *n* slips on to the upper pin or stud, *p*, the valve, *g*, is closed and steam is again admitted into the cistern or reservoir through the apertures *i*, *i*, the pressure of steam on the surface of the water soon causes the valve in the pipe, *w*, to open when the water falls into the boiler by its own gravity, as soon as the water has run out of the cistern or reservoir so as to leave the float, R, suspended by the lever *m*, *m*, the weight or power of the float (out of water) being double that of the counterbalance *y*, it will cause the upper pin or stud to be liberated, from the upper catch, the pistons will be forced up as before, and so on. Thus my apparatus whenever the water in the boiler or boilers gets low, first prepares itself to supply the boiler or boilers, and while the water is going into it for that purpose, it is giving an alarm, or telling that it is in operation, and also that water is wanted in the boiler or boilers.

I do not intend to confine myself to any particular material in the manufacture of my apparatus, or to the within specified or any particular dimensions as the same may be varied much.

I do not claim to be the first to have invented a self operating mode of supplying steam boilers with water from a reservoir attached to said boiler by constructing the boiler with a float in its interior, attached to a lever governing a valve which when operated by the descent of the float opens a

passage between the reservoir and boiler for the water to pass in permitting the steam at the same time to press through another passage on the surface of the water in the reservoir. Nor do I claim in combination with this arrangement a mode of supplying the reservoir with water by forming a vacuum within it and forcing the water up by atmospheric pressure, but

What I do claim and for which I desire to procure Letters Patent of the United States is—

The particular manner in which I have combined the float and valve of the boiler with the reservoir and boiler and the passages connecting them by means of a cylinder and pistons of peculiar construction and the apparatus connected therewith and also combining with the same the float and lever within the reservoirs and the tube for supplying said reservoir with water, so as to produce a self acting apparatus both for supplying the boiler and reservoir with water, that is to say I claim, first, the combining with the reservoir A, A, which receives the water for supplying the boiler, the connecting tube, 9, the cylinder, *b*, the pistons, *d*, *d*, the bars, *f*, *f*, and the valve, *g*, constructed and operating substantially as set forth, 2nd the combining with the foregoing apparatus the float, lever, and valve within the boiler for admitting steam into the tube 9, on the descent of the float 5, the pipe, *h*, for supplying the reservoir with water and the tube, *u*, for conducting it into the boiler, the whole being constructed and operating as described; 3rd I claim the mode of governing the supply valve, *g*, and regulating the admission of steam into the reservoir, by means of the lever *m*, *m*, provided with a float, R, and a counterbalance, *y*, and furnished with catches *n*, *n'*, as set forth and combined with the bars *f*, *f*, having studs or pins *p*, *p'*, to which said catches are adapted in the manner and for the purpose herein described, 4th combining the whistle or alarm C, with the cylinder, *b*, steam pipe, 9, and pistons *d*, *d*, as set forth for the purpose of giving an alarm when the water is low in the boiler.

JOHN HAMPSON.

Witnesses:
JAMES O'D. HOLLOWAY,
CHARLES MAES.