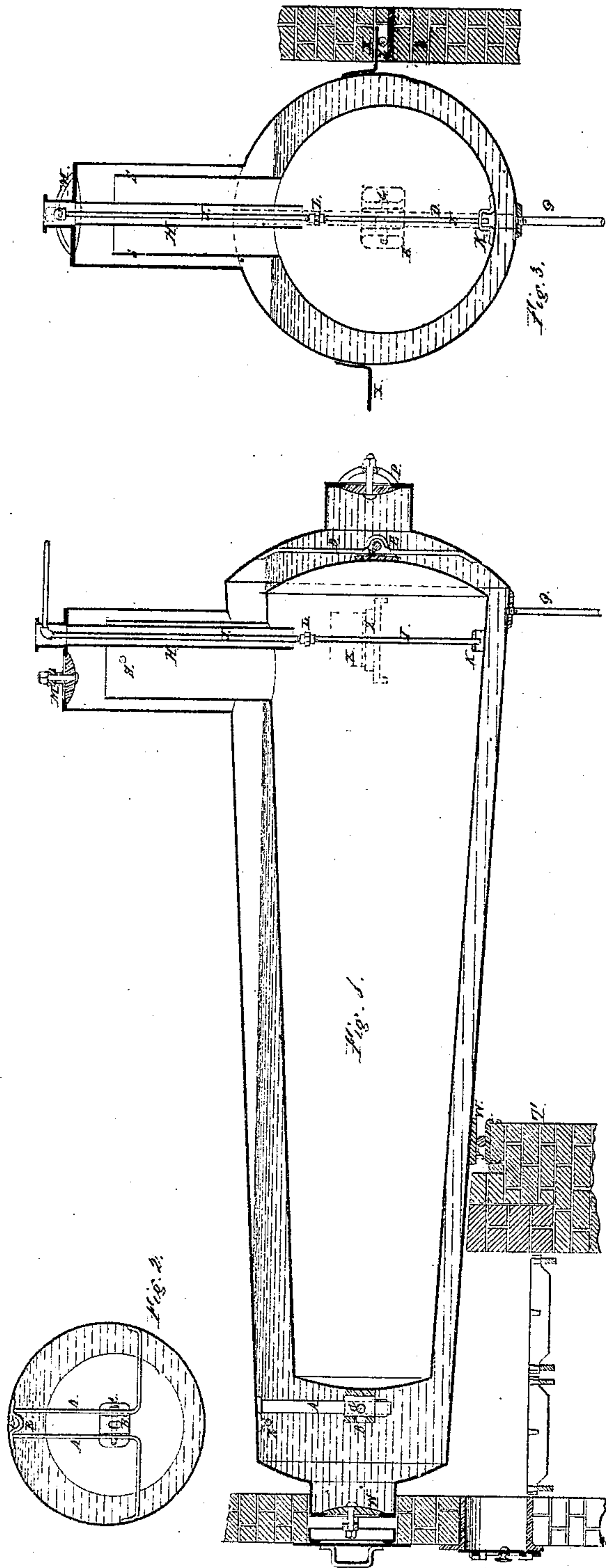


G. A. Stone,

Flue Boiler.

No. 105275.

Patented July 12. 1870.



Witnesses.

R. M. Titmuss
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GEORGE A. STONE, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. 105,275, dated July 12, 1870.

To all whom it may concern:

Be it known that I, GEORGE A. STONE, of the city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Steam-Boilers and Modes of Setting the Same in Masonry; and I do hereby declare that the following specification, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings, Figure 1 is a longitudinal section of a boiler containing a steam-reservoir embodying my improvements. Fig. 2 is a sectional elevation of the front end of the same boiler, showing the front end of the reservoir with its attachments. Fig. 3 is a sectional elevation through back end of the boiler, reservoir, and steam-drum, the same letters referring to the same parts in all the figures.

The first part of my invention relates to suspending and securing steam-reservoirs in boilers in such a manner that they are conveniently and readily movable therein.

The second part of my invention relates to setting the same in masonry upon rollers, one or more being arranged to roll in the direction of the longitudinal expansion of the boiler, and another one or more to roll in the direction of the lateral expansion of the same, thus facilitating all movement caused by expansion and contraction, and preventing the straining of the boiler and the racking of the masonry that are apt to occur when the boiler is held rigidly in its place.

The ordinary method of fixing such reservoirs has been by riveting or bolting them securely to the shell of the boiler by one or more brackets or fixtures at either end, the other being left loose to slide in a socket or hook fastened to the boiler, and thus allow the reservoir to expand independently of the boiler-shell. With this arrangement the reservoir becomes a permanent fixture within the boiler, and cannot be moved out of its position without first removing the fixtures fastened to and about it. Now, my invention is intended to provide means whereby the reservoir may be firmly secured in its proper position in the boiler, and at the same time be easily detached therefrom and moved at will up and down or from side to side.

In Fig. 1, A A are two guide-rods secured

to the shell of the boiler near its front end, and B is a bracket fastened to the front end of the reservoir and sliding in the vertical groove or slot formed by the position of the guide-rods A A, said slot or groove serving as a guide in raising or lowering the reservoir; and C is a loose pin or bolt passed through the bracket B and guide-rods A A, and secured by nut or pin at one end to prevent its being accidentally withdrawn. In the same manner, D is a guide-rod secured to the back end of the boiler, and E is a bracket fastened to the back end of the reservoir, having wings or lugs which embrace the sides of the guide-rod D.

G is a loose pin or bolt, passed through the wings of the bracket E and guide-rod D, to hold the back end of the reservoir in position, and having a nut or pin at one end to prevent its being accidentally withdrawn.

H is a steam-pipe secured to the cover of the steam-drum, and depending into the reservoir, and through which the steam generated in the boiler is discharged.

J is a pipe leading from near the bottom of the reservoir up within the steam-pipe H and out through its side near the top, for the purpose of discharging any water which may have condensed within the reservoir or primed over from the boiler.

K is a steadiment fastened to the inside of the reservoir near its lowest point, and serving to steady the lower end of the pipe J. This pipe J has a union coupling, L, for the purpose of disconnecting and removing the lower portion of it when required.

M is a man-hole in the drum-head, closed by a plate and cross-bar, and N and P are similar openings at the two ends of the boiler to enable a man to enter either reservoir or boiler.

Q is a pipe for introducing the feed-water into the boiler.

It is evident that when the brackets B and E are connected, respectively, with the guide-rods A A and D by the pins or bolts C and G the reservoir will be suspended and held in a fixed position, and the reservoir so nearly filling the boiler, it would be impossible for a man to enter the latter for cleaning or repairing it; but by the peculiar arrangement specified the reservoir may be readily detached from its fastenings and moved up and down or from

side to side, so as to allow a man to enter the boiler and reach any part of it. To do this, descend into the reservoir through the man-hole M and detach the pipe T at its coupling L; then enter the man-hole N and attach a turn-buckle to the bracket B and eyebolt R, fastened to the shell of the boiler; also attach another turn-buckle to the nozzle of the reservoir at S, its other end being attached to any convenient fixed support clear of the reservoir. On tightening these two turn-buckles the pins or bolts C and G may be withdrawn, and the reservoir, now suspended by the turn-buckles, may be moved about in the boiler at pleasure, and readily restored to its original position and fastenings when the object of detaching and moving it has been accomplished. When the reservoir has been restored to its original position, the lower portion of the pipe J should be replaced. The drain-pipe J need not necessarily be carried up within the steam-pipe H, but may proceed alongside of it to the top of the steam-drum, and thence out through its side at any convenient point, care being taken that it be not rigidly fastened to the reservoir at any point. In such case the union coupling L will be more conveniently attached near its top under the cover of the steam-drum, instead of below the end of the steam-pipe H, as shown, and in that case its lower portion may be detached without sending a man inside the reservoir. The usual mode of attaching this drain-pipe J has been by securing it entirely through the boiler-shell into the shell of the reservoir at or near its lowest point, so that there was danger of breaking or loosening this pipe and causing leakage into the reservoir in case the latter was not securely fastened in the boiler, owing to imperfect workmanship. The ordinary mode of setting such boilers has been by securing a lug to the front end and another at each side, near the back end of the boiler. These three lugs resting firmly in the walls of the masonry, and no provision being made for the proper expansion and contraction of the boiler independent of the walls, the latter are liable to become cracked and loosened.

In the figures, T is a pier built into and forming a part of the bridge-wall of the furnace, upon which is placed a cap, V, of cast-iron or other suitable material. A plate, W, is riveted to the shell of the boiler, between which and the cap V is inserted one or more rollers,

Y, or a series of balls in case the latter be used. The cap V or plate W, or both, should have ledges around their sides, to prevent the balls from sliding out from their positions. In this way the point of support is removed from the front end of the boiler—its usual position—to a point behind the bridge-wall, thus leaving the front end of the boiler free to expand and move in the front wall of the masonry without danger of cracking or otherwise injuring that wall. Near the back end of the boiler are secured lugs X X, also resting upon rollers Z and plates set in the side wall of the masonry. These rollers Z are placed longitudinally in the brick-work, or parallel with the center line of the boiler, to allow it to expand sidewise without forcing the walls; but not to move forward or backward. It will thus be seen that the boilers in expanding longitudinally will move forward on the roller Y, or balls between the plates V and W, and in expanding transversely will move sidewise on one or both the rollers Z placed under the lugs X X, the back end of the boiler and steam-domes in the wake of the lugs X X remaining stationary, or nearly so; and the walls of the masonry will not be affected by the movements of the boiler, but expand and contract independently.

I am aware that rollers have been used to support the ends of steam-boilers set in masonry; but they have been always placed so as to move only in the direction of the longitudinal expansion of the boilers, so far as I know, and no provision has been or could be made for lateral expansion of the boilers, the upper portion of the same being usually closed in solid, with brick-work connected to and forming part of the walls.

Having thus described my improvement, what I claim as new and of my own invention is—

1. The suspending and securing in a boiler a steam-reservoir, substantially in the manner by the means and for the purpose described.
2. The transverse roller Y or its equivalent, in combination with the longitudinal rollers Z, substantially as and for the purpose specified.

GEORGE A. STONE.

Witnesses:

R. M. GILMOUR,
C. V. KASSEN.