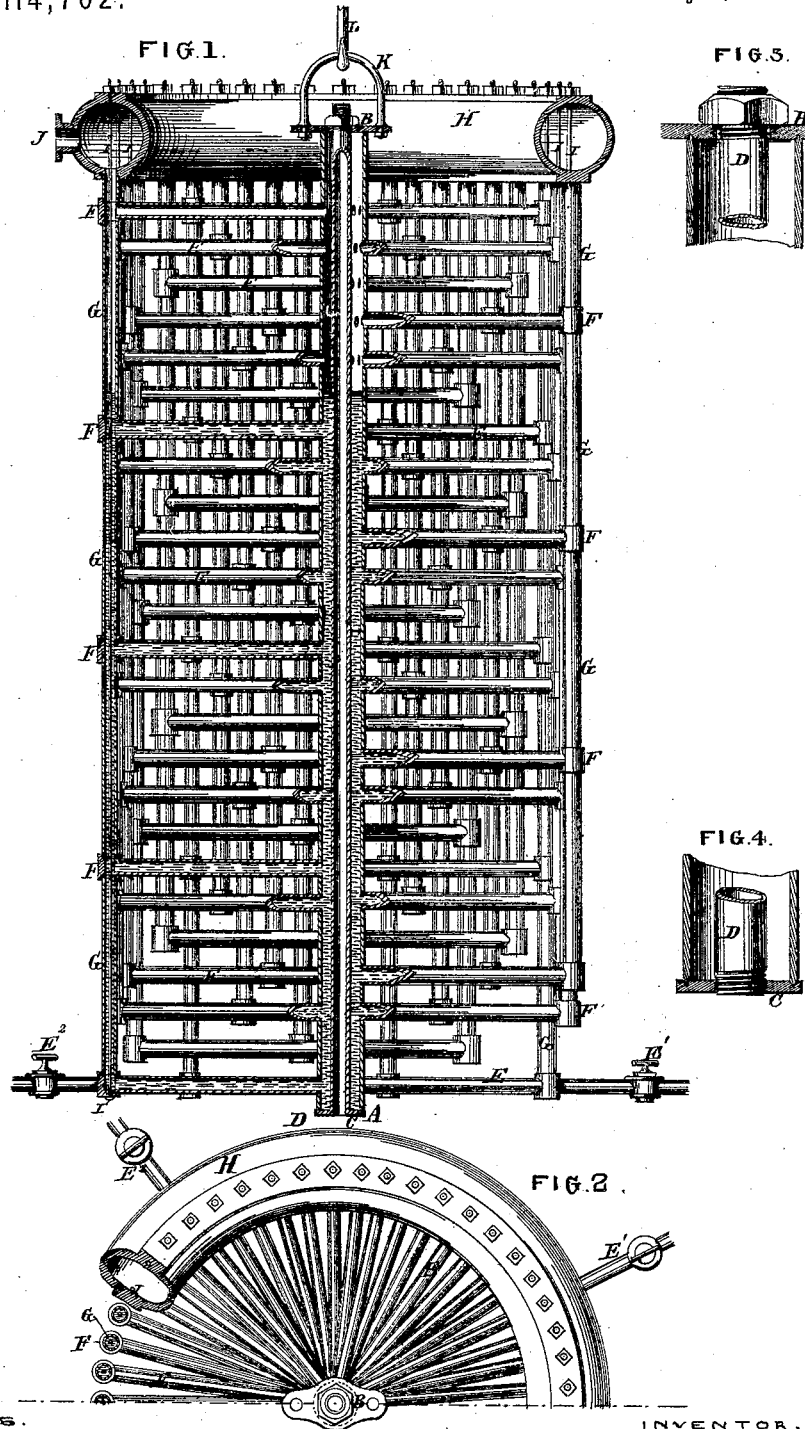


THOMAS W. H. MOSELEY.
Improvement in Steam-Generators.

No. 114,702.

Patented May 9, 1871.



WITNESSES.

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THOMAS W. H. MOSELEY, OF HYDE PARK, MASSACHUSETTS.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **114,702**, dated May 9, 1871.

I, THOMAS W. H. MOSELEY, of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented a new and Improved Steam-Generator or Water-Heater, of which the following is a specification:

Nature and Objects of the Invention.

My generator or heater is constructed with a central flue passing vertically up through its entire height, and surrounded by an annular water-main, from which project radial hollow arms or branches, connecting at their inner ends with the annular water-space, and arranged around the center in a peculiar manner, hereinafter described, so as to cause the deflection of the products of combustion which pass upward among them and cause the said gases to part with their heat before escaping. The outer ends of the hollow arms or branches are coupled to vertical pipes, which communicate with an annular steam-drum at top, as hereinafter described.

The entire structure, consisting of the aforesaid annular connecting-main, the hollow branches projecting radially therefrom, the vertical connecting-pipes, and the annular steam-drum at top, is suspended within a suitable furnace, from which it may be readily removed for cleaning or repair.

Description of the Accompanying Drawing.

Figure 1 represents a vertical axial section of the entire generator and furnace. Fig. 2 is a plan or top view of one-half of the same. Fig. 3 is a vertical section, on a larger scale, of the upper end of the water-main and center flue with their connections. Fig. 4 is a similar section of the lower end of the same.

General Description.

My steam-generator or heater is constructed as follows: I first take a large gas or other wrought-iron pipe to constitute a vertical trunk or main, A. This pipe is made of a length to correspond with the desired capacity of the generator. For a medium-sized generator, (one of sixteen-horse power, for illustration,) I employ a main three inches in diameter and six feet long. These relative proportions may be varied where, from economic or other reasons, a generator of larger or smaller capacity

is required without a corresponding increase or diminution in length.

The ends of the main A are fitted in V-shaped annular grooves in cast-iron caps B C, by which the ends are closed.

In the center of the caps B C holes are tapped to receive the threaded ends of an interior pipe, D, which is of one-half the diameter of the main pipe A, and is thus fitted concentrically within the latter.

The upper end of the inner pipe passes through the top or upper cap, B, and a nut driven down its threads and pressing down on the said cap forces the ends of the pipe into the V-grooves, and thus produces tight joints.

The interior of the inner pipe, D, constitutes a fire-flue, and the interior of the main pipe, A, around the inner pipe, D, constitutes the main distributing water-space. The water in said space is thus exposed to heating-surfaces inside and out.

Holes are bored and tapped in the main A, beginning near its lower end and extending around it, say seven (more or less) in a circuit. Into these holes are screwed horizontal branch pipes E, one-fourth the diameter of the main, so that the collective capacity of the branches will correspond with that of the annular space between the central flue and the main.

The branches are so disposed in the successive courses that one of them will not come directly over another until the seventh course is reached, in which the branches may correspond in their circumferential position with those in the seventh rank below.

The lower sides of the branches are thus exposed in the most uniform and efficient manner to the action of the heated products of combustion, which rise within the furnace and circulate freely among all the branches.

In order to provide for the free circulation of water, and to conduct steam as fast as it is evolved to the steam-drum at top of the generator, I apply at the outer ends of all the horizontal branches coupling-heads F, with horizontal threaded holes to receive the ends of said branch pipes, and as all the branch pipes are made of exactly equal length, all the coupling-heads will be accurately at the same distance radially from the center of the main.

On the top and bottom of the coupling-heads F are V-shaped grooves, extending concentrically around the vertical bore thereof, to receive the ends of vertical circulation-pipes G, which form a connection from top to bottom between the ends of all the pipes which are in one vertical line. The joints at the end of these pipes, and all similar joints in the structure, are formed with fiber gaskets or luting saturated with white or red lead ground in oil.

The upper ends of the vertical circulation-pipes G are in like manner fitted and jointed in annular V-shaped grooves surrounding apertures in the under side of the upper steam-drum H.

Rods I, which may be in diameter equal to slightly more than one-half the internal diameter of the upright pipes G, pass through the said pipes and through the steam-drum H from bottom to top. Heavy screw-threads are cut on both ends of the said rods, so that by driving up with a wrench the ends of the pipes are forced firmly into their grooves, and secure joints are thus produced. This mode of construction will be seen to provide for the ready removal of any of the pipes for repairs or other purposes by simply unscrewing the nuts from the top of the steam-drum, and taking out any upright or branch tube that may be defective.

The construction and the repair of this generator are greatly simplified and cheapened by making all the branch pipes for any given size and style of generators precise counterparts of each other, and so with the vertical circulation-pipes G.

The upright or circulation pipes are intended to be as close together as practicable, and, consequently, the length of the branch pipes is made only sufficient to produce this result; so, then, if the main A is less, so are the internal fire-flue D, the branches E, and the uprights G, giving the outside diameter its proper relative proportion.

The steam-drum H may be of heavy cast-iron. It forms a horizontal hollow ring of quite large size, having a capacity equal to that of all the uprights combined. It forms a way of communication between all the uprights and the upper end of the annular water-space in the central main, A, and, as its name implies, receives the steam as fast as it is

evolved from the water circulating through all the pipes.

The steam is taken out through a branch or neck, J, to which a steam-pipe may be coupled, in the customary manner.

The feed-water is introduced through any one or more of the branch pipes, as at E¹, in the lower part of the generator, immediately above the fire, and entering here it is rapidly heated, and though it may enter cold it does not interfere with or check the evolution of steam in the upper part of the generator.

E² represents a branch pipe employed as a "blow-off" for the removal of sediment.

K is a yoke or bail secured to the upper cap-plate, B, of the central main, A, for suspending the entire structure within the furnace by a hanger, L, which may be attached to any suitable machinery for elevating it out of the furnace when necessary.

The furnace may be of any suitable construction. That which I prefer to use will be made the subject of a separate application for Letters Patent.

It is intended that the flame and heated products of combustion shall completely surround and envelop all the pipes of the generator.

My boiler is equally well adapted, without material change in construction, for heating water, for warming buildings, or for other purposes.

Claims.

I claim as my invention—

1. The combination of the central main, A, radial branches E, vertical circulation-pipes G, couplings F, and the rods I, arranged substantially as and for the purposes set forth.
2. The central water-main, A, and flue-pipe D within the same, constructed and connected as described.
3. The annular steam-drum H, in combination with the distribution-pipes G and radial branches E, as explained.
4. The suspension devices K L, or their equivalents, in combination with a heater or generator, constructed substantially as herein described, for the purposes set forth.

THOS. W. H. MOSELEY.

Witnesses:

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WM. H. BRERETON, Jr.