R. A. Chesebrough.

Steam Furnace.

No. 93,170. Patented Aug. 3, 1869.

Fig. 1

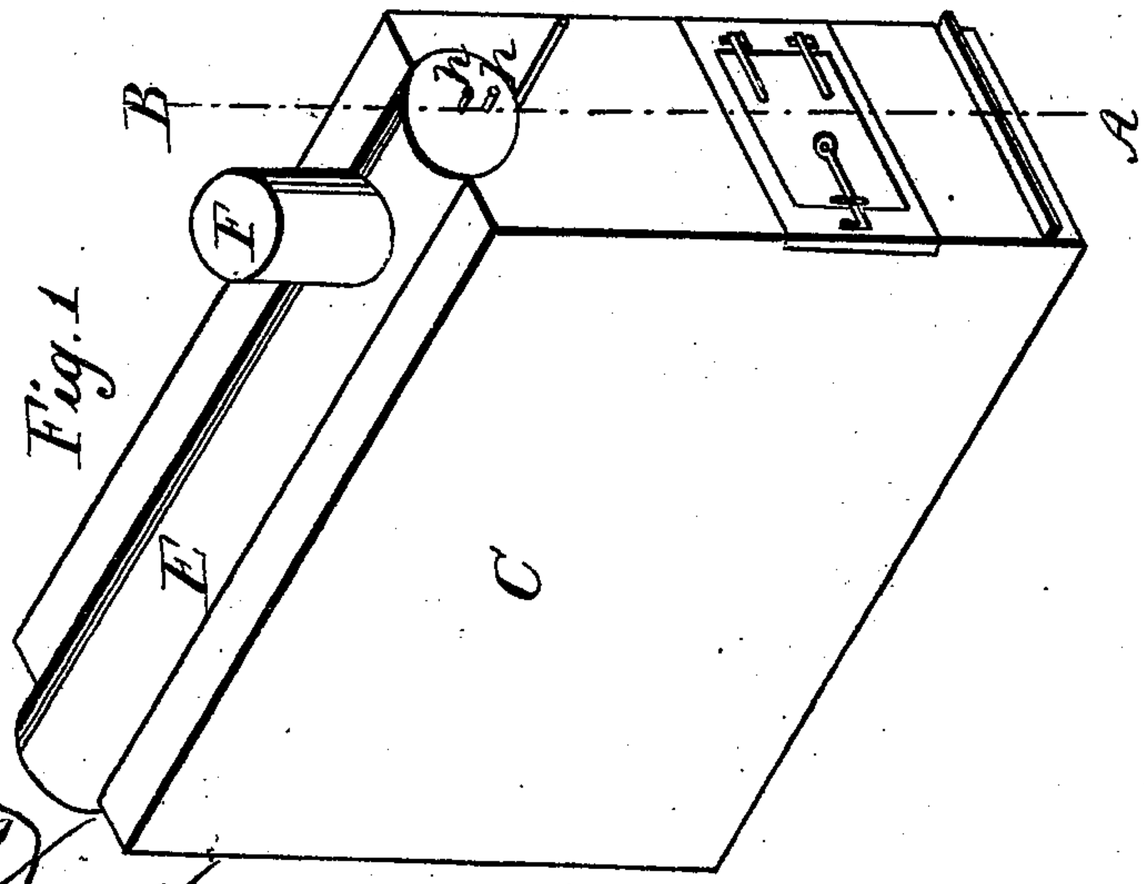


Fig. 2

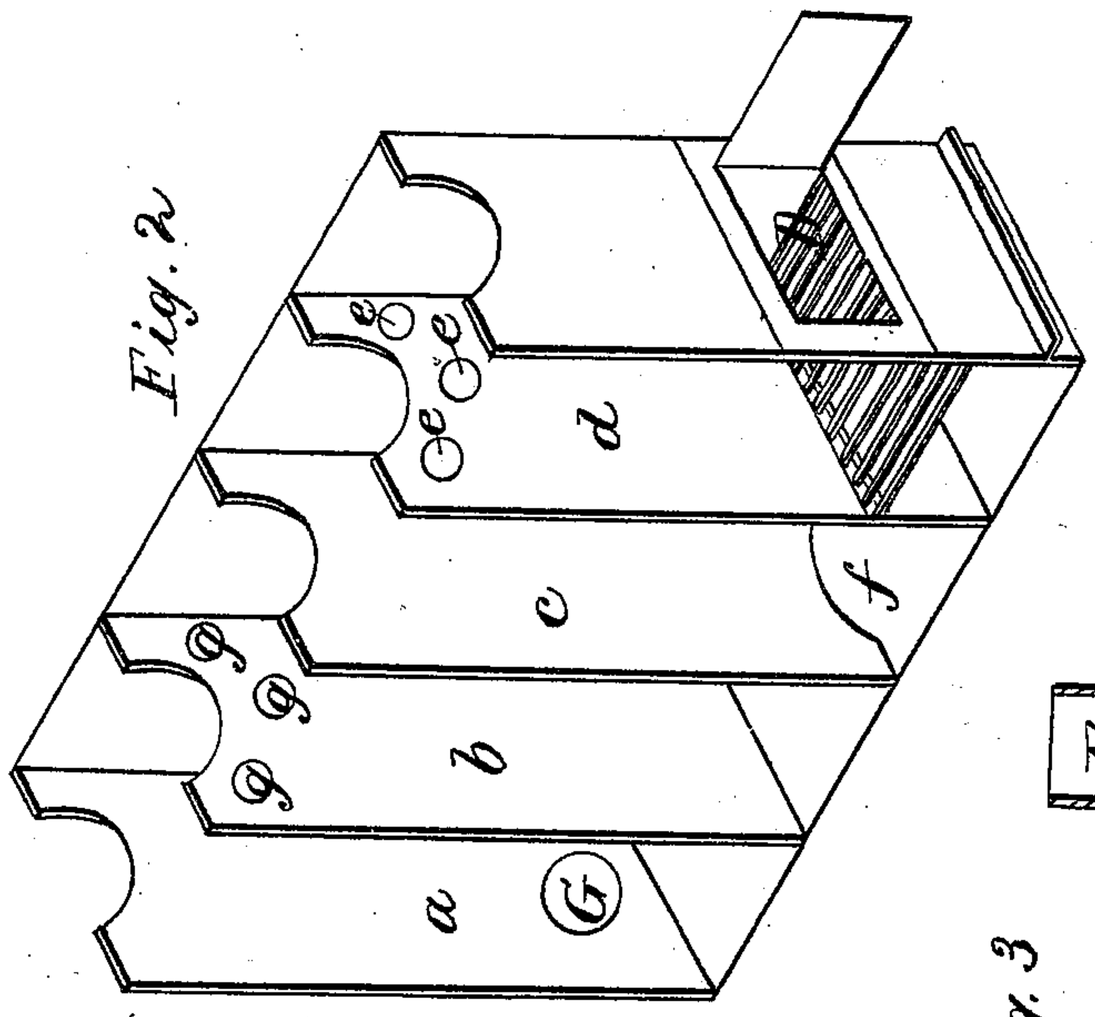
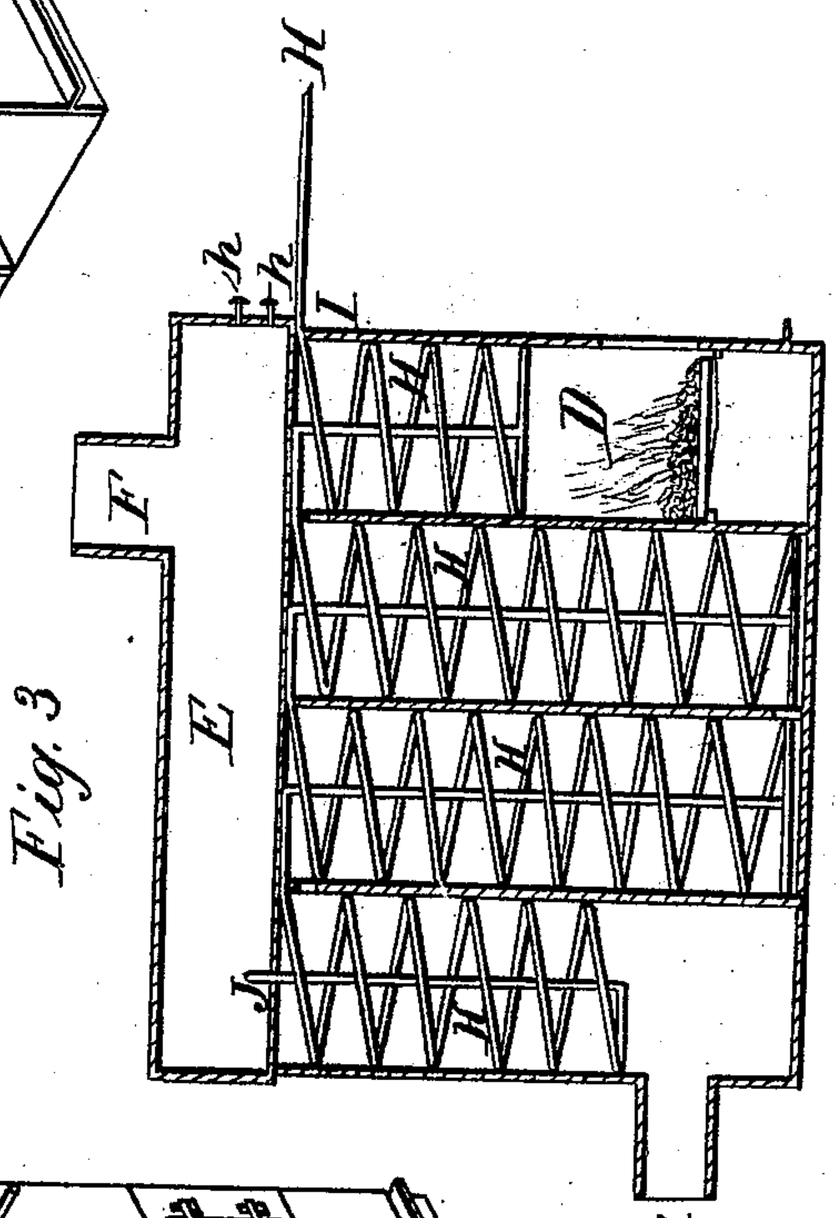


Fig. 3



Witnesses

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ROBERT A. CHESEBROUGH, OF NEW YORK, N. Y.

Letters Patent No. 93,176, *dated August* 3, 1869.

IMPROVEMENT IN STEAM-GENERATOR.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, ROBERT A. CHESEBROUGH, of the city of New York, State of New York, have invented a new and useful Improvement in Steam-Boilers and Furnaces; and I hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, which forms part of this specification.

The object of this improvement is to produce a steam-boiler and furnace, for motive-power and heating-purposes, which will generate steam with rapidity, and consume less fuel than those now generally in use.

My invention consists in constructing a brick furnace in several distinct compartments, in each of which the continuation of a single long worm is coiled, one end of which connects with the water-pump outside the furnace, and the other end with the steam-receiver, which receiver is laid horizontally on the top of and acts as a ceiling to each of the several compartments.

The heat from the fire, which is placed in the first compartment, is obliged to successively enter and fill each compartment, and so heat the entire room, as also the steam-receiver, before it can escape up the chimney.

The water, from which the steam is generated, is contained in the worms or pipe, and may also cover the bottom of the steam-receiver, to afford a larger surface for evaporization.

Steam-generators have before been constructed, in part, of pipe or worms; but, in all such, it will be seen that they are made of a series of pipes, having several communications with each other, and with the drum-head or steam-receiver, while the distinctive feature in my boiler is, that the worm is made in one long, continuous piece, having but one connection, at its extreme end, with the steam-receiver, so that every gallon of water forced in at the beginning of the worm, must pass through its entire length before entering the receiver.

Furnaces have been before constructed so that the heat may be conducted along the sides, or amongst the tubes of a boiler; but the distinctive feature of my furnace is in the separate compartments, their connections with each other, and the method of conducting the heat so that it shall be obliged to fill each compartment successively, thus heating the worm therein, and the steam-receiver on top.

Having thus explained the general character of my invention, the following brief description, with reference to the accompanying drawings, will suffice to show how the same is or may be carried into effect.

Figure I is an oblique view of the exterior of the boiler and furnace.

Figure II is an oblique inside view of the heating-compartments of the furnace.

Figure III is an inside side view of the water-worm, and its location.

Similar letters indicate corresponding parts.

Let C represent a furnace, which, for example, may be said to be about twelve feet long, six feet high, and four feet wide, the interior of which is divided longitudinally into four compartments, *a b c d*, each of which will be (allowing for the thickness of the outside, and dividing brick walls,) about two feet square and five feet deep.

The fire-grate and grate-bars are situated at D, in the first compartment, *d*.

The steam-receiver E, which is of cylindrical form, about one foot in diameter, and twelve feet long, and having a steam-drum, F, thereon, lies horizontally on top of the furnace, being supported by the brick-work which separates the compartments, and forms the ends of the furnace, into which it is sunk, so that it forms a complete ceiling or top for each compartment.

The heat, generated by the fire at D, rises and passes through the openings *e* into the compartment *c*, which it fills, and, descending, passes, by the outlet *f*, into the compartment *b*, which it fills, and, rising, passes, through the openings *g*, into the compartment *a*, which it fills, and, descending, passes into the chimney by the flue G.

Thus, the heat passes alternately into one compartment at the top, and into the next at the bottom, and so fills, in succession, every part of each compartment, before being drawn by the draught into the chimney.

In the several compartments *a b c d* is coiled a long, continuous worm, in one length, H, the outside end of which communicates with the water-pump.

It enters the compartment *d* at I, in which it is coiled, and then passes through the brick partition, by a tight joint, into the compartment *c*, where it forms a second coil; thence into *b*, where it forms a third coil; and thence into *a*, where it forms a fourth coil; and thence into the steam-receiver E, by a tight joint, at the point J.

Thus, the worm passes through all the heated chambers in succession, and the water therein is subjected to great heat, and may be all converted into steam before entering the receiver; but it is better that the engineer will so regulate his water-pump and fire as to allow the bottom of his steam-receiver to be covered with water, the height of which he can regulate by the cocks *h h*.

The heat, which the receiver E is subjected to by being embedded in the compartments *a b c d*, will be sufficient to vaporize the hot water therein contained, and keep up a head of steam for constant use, which is taken by a pipe from the steam-drum F, in the usual way.

It is apparent that the furnace-sides and dividing-partitions can be made of iron instead of brick, and the apparatus put on wheels, and thus made portable.

Instead of being coiled, the worm may be composed of short pieces of straight pipe, connected by elbows or return bends.

What I claim as my invention, and desire to secure by Letters Patent, is—

The coiled pipes or worm H H, steam-receiver E, and the heating-compartments *a b c d*, constructed and arranged, relatively to each other, substantially as described.

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Witnesses:

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