

D. T. CASEMENT.
Furnaces for Steam-Boilers.

No. 149,638.

Patented April 14, 1874.

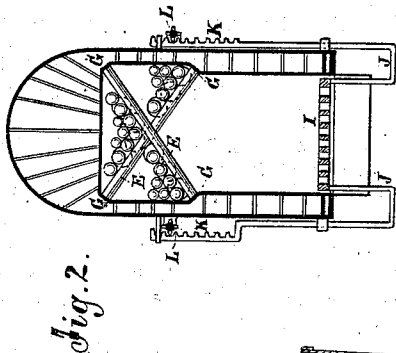
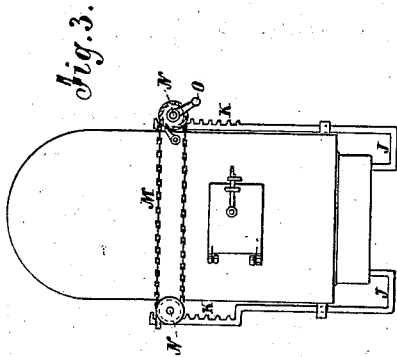
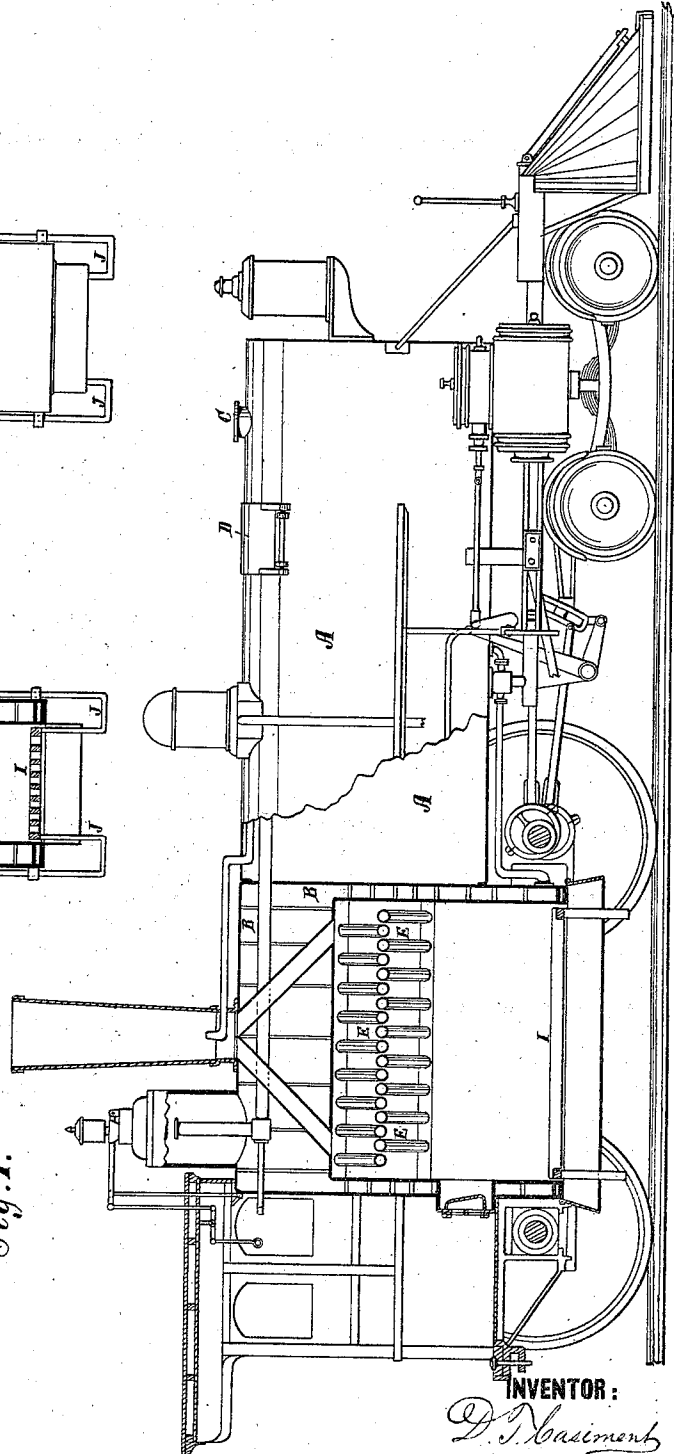


Fig. 1.



WITNESSES:

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BY

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UNITED STATES PATENT OFFICE.

DANIEL T. CASEMENT, OF PAINESVILLE, OHIO.

IMPROVEMENT IN FURNACES FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **149,638**, dated April 14, 1874; application filed February 7, 1874.

To all whom it may concern:

Be it known that I, DANIEL T. CASEMENT, of Painesville, in the county of Lake and State of Ohio, have invented a new and useful Improvement in Furnaces for Steam-Boilers, of which the following is a specification:

The invention consists in a system of inclined tubes in the upper part of the furnace for supporting metal balls, to facilitate the combustion of the gases by their impinging on the red-hot surfaces of the balls, in which heat is stored up. The said tubes are arranged in two series, extending from the top or near it on opposite sides diagonally across and downward, crossing each other at the middle, forming chambers for storing the balls. They are arranged in this way to facilitate the fastening of them in the furnace-walls; also, the cleaning of them from time to time of the deposit that may result from the use of salty or limy water.

Figure 1 is a longitudinal sectional elevation of a locomotive constructed according to my invention. Fig. 2 is a transverse sectional elevation through the furnace, and Fig. 3 is an end elevation.

Similar letters of reference indicate corresponding parts.

A represents a tank, which is arranged in front of the boiler B, and presents the appearance of a prolongation of the latter beyond the fire-box. The tank has an opening, C, and door D, and is used to temporarily weight the locomotive with water or sand for ascending steep grades. E represents the pipes or hollow grates, as I now propose to ar-

range them, for holding the balls F, used to facilitate the combustion of the gases by the impinging of the gases on them. These grates descend from the upper portion of the furnace-chamber across to lower points on the other side, entering portions G of the furnace arranged at right angles to them, and fasten in any approved way, say by riveting the ends over ferrules fitted in the plates. This is considered an efficient mode of arrangement for circulation of the water, while it is very simple and cheap. Hand-holes may be made in the side walls of the furnace at the lower ends of the tubes, through which to insert scrapers for cleaning out any deposit of salt, lime, or other sediment that may lodge in them. The furnace-grate I is supported on the bars J, extending down through the bottom of the fire-box under the sides and up along the outside, and having the upper portions K provided with teeth, with which the shafts L, extending along the sides to the front, gear for raising and lowering the grate. In front of the boiler said shafts are connected, by an endless chain, M, and pulleys N, to be worked in unison, and one has a hand-crank, O.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The ball-holding tubes E, arranged substantially as represented in the drawings.

DAN. T. CASEMENT.

Witnesses:

A. P. THAYER,
T. B. MOSHER.