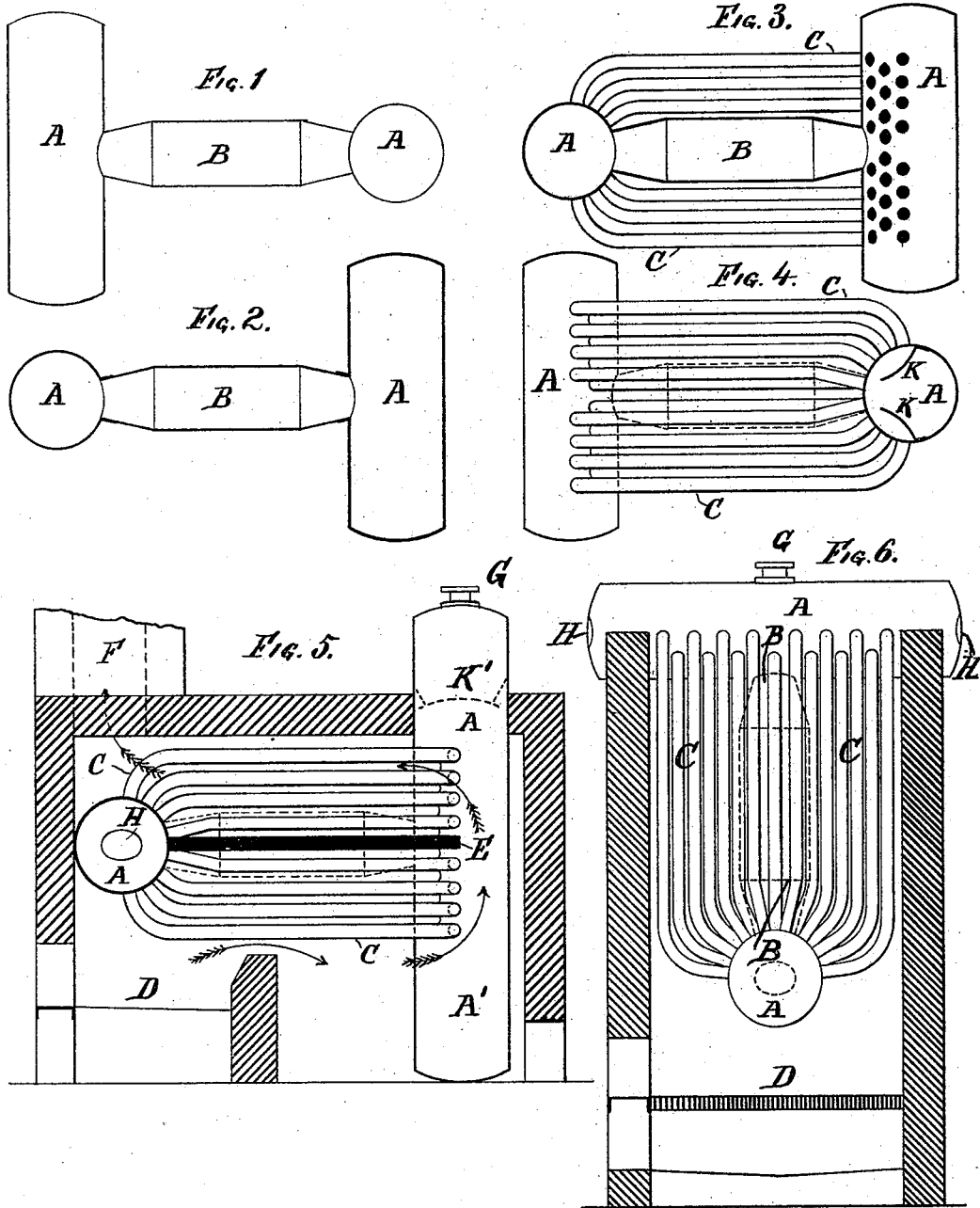


(No Model.)

J. MAHONY.
STEAM BOILER.

No. 456,365.

Patented July 21, 1891.



WITNESSES:-
Wm. H. Deightman

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INVENTOR:-
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UNITED STATES PATENT OFFICE.

JAMES MAHONY, OF NEW YORK, N. Y.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 456,365, dated July 21, 1891.

Application filed February 14, 1891. Serial No. 381,481. (No model.)

To all whom it may concern:

Be it known that I, JAMES MAHONY, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates specially to the construction of a water-tube boiler whereby decreased diameters and direct and rapid circulation, as well as increased area of heating-surface, are provided for; also, whereby dry steam at high temperatures and pressures may be readily and safely generated and maintained; also, the construction of a boiler that can be used either in a vertical or horizontal position without detriment to its usefulness.

A special improvement consists in connecting the two end shells together by means of a tie-shell, so that no longitudinal strains can come upon the tubes.

Other improvements consist in the construction, arrangement, and combination of these several parts or portions comprising the boiler and its setting or housing, as may be herein-after shown and described.

Referring to the drawings, Figures 1 and 2 are construction details showing the method of connecting and tying the shell portions together to secure reliable strength in the construction. Figs. 3 and 4 show position and method of placing the water-tubes. Figs. 2 and 4 are sectional views. Figs. 5 and 6 represent preferred methods of setting the boiler either horizontally or vertically.

Similar letters of reference designate like parts or portions in all the figures.

The letter A designates the two end shells of the boiler, each of which is set in a plane vertical or at right angles to the other, as shown.

B designates a tie-shell connecting the two end shells together. This central shell is preferably made conical in shape at the ends, as shown, to reduce the amount of metal to be removed from the end shells. The object of this tie-shell B is to securely hold the two outer shells A together against all possible chance of separation arising from the longi-

tudinal thrust of steam-pressure, and thus relieve the tubes from all work except that of furnishing water-heating surface.

C designates a collection of water-tubes passing between and connecting the outer shells A and providing water and steam communication between the two.

It will be readily seen that the boiler can be turned end for end, no matter how it is to be used, whether as a vertical or as a horizontal boiler.

D designates the furnace-chamber.

In Fig. 5, E designates a guide plate or partition to control the movement of heat and products of combustion from the furnace to the chimney, and F designates the chimney or flue.

G designates a steam-outlet, and H the man-hole plates or openings.

When the boiler is set vertically, as in Fig. 6, baffle-plates K, as shown in sectional view, Fig. 4, are used in the upper shell. When it is set horizontally, baffle-plates K' are used in rear shell, as shown in Fig. 5. These plates are to separate the steam and water from each other and prevent the water as it passes in circulation from the tubes from spurting into the steam-space.

When the boiler is set horizontally, the front shell lies horizontally across and above the furnace and grate, being supported in such position by the side walls, and the rear shell stands in a vertical position, as shown in Fig. 5. With the partition in place at E the heat and products of combustion pass horizontally through the mass of tubes below the partition to and about the rear shell, as shown by the arrows, thence upward and through the mass of tubes above the partition E, in a forward direction, and out through the flue or chimney at F.

When the boiler is set vertically, as shown in Fig. 6, the bottom shell A is suspended in a horizontal position immediately over the furnace and in direct reach of the heat. The upper shell A rests horizontally upon the supporting side walls and carries the weight of tubes, center flue, and bottom shell, or the bottom shell may itself rest within the side walls.

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

1. A steam-boiler consisting of two end cylinders, each set in a plane vertical to that of the other, a tie-shell connecting the said cylinders at a point midway between the ends of the same, and a collection of water-tubes arranged substantially as shown and described.

2. In combination with its furnace and supporting-walls, a steam-boiler consisting of a front horizontal cylinder located immediately over the furnace, a rear vertical cylinder, a horizontal tie-shell connecting the said cylinders at a point midway between the ends of the same, and a collection of water-tubes ar-

anged and connected substantially as shown and described.

3. In combination with the furnace and supporting-walls, a steam-boiler consisting of an upper horizontal cylinder, a lower horizontal cylinder, a vertical tie-shell connecting the said cylinders at a point midway between the ends of the same, and a collection of water-tubes arranged and connected substantially as shown and described.

JAMES MAHONY.

Witnesses:

WM. H. WEIGHTMAN,
GEORGE EDWARDS.