

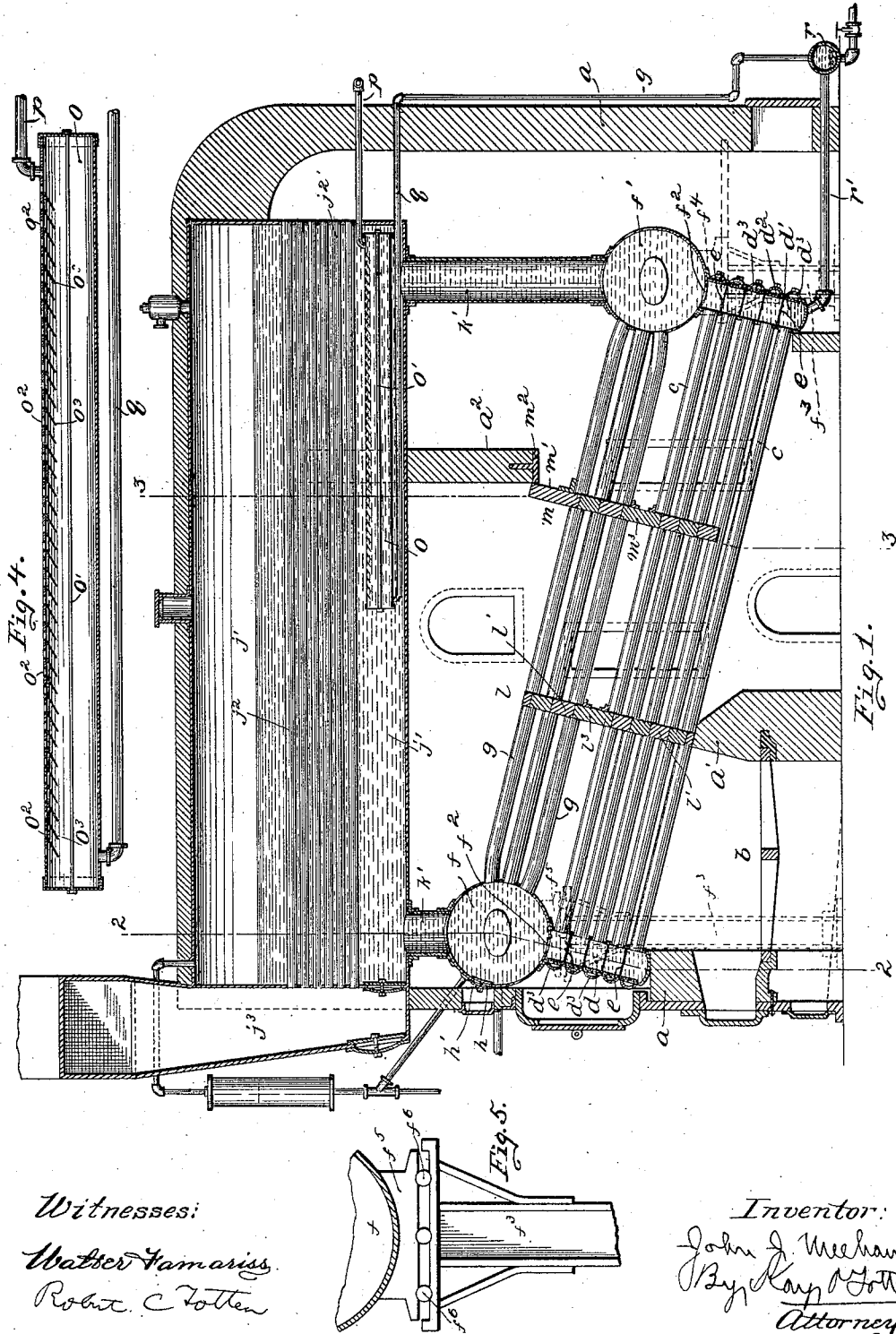
(No Model.)

2 Sheets—Sheet 1.

J. J. MEEHAN.
BOILER.

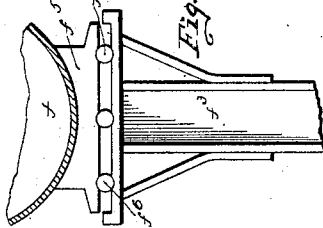
No. 574,925.

Patented Jan. 12, 1897.



Witnesses:

Walter Vamariss
Robert C. Totten



Inventor:

John J. Meehan
By: Roy C. Totten
Attorneys.

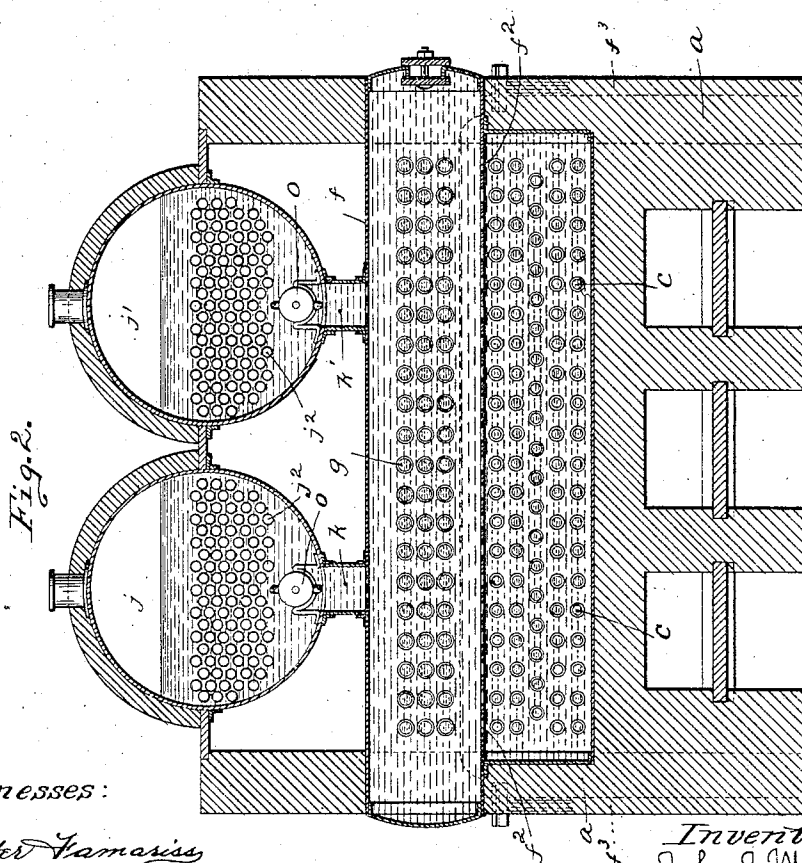
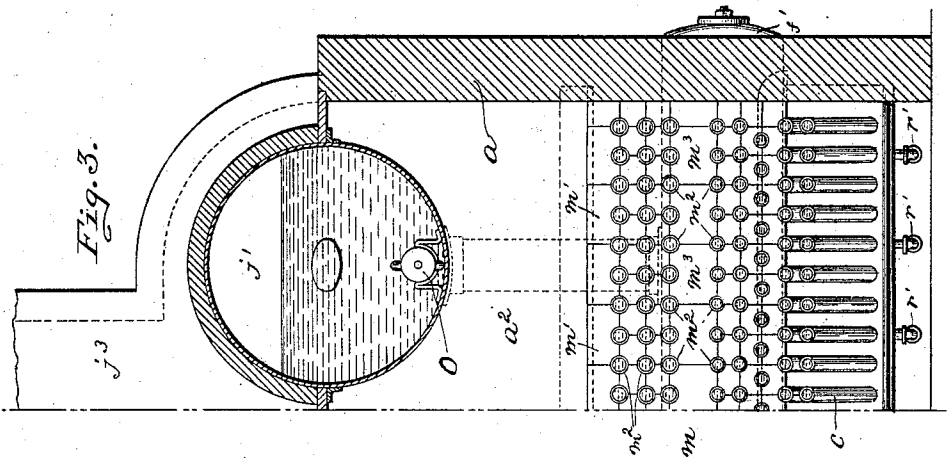
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Inventor:
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UNITED STATES PATENT OFFICE.

JOHN J. MEEHAN, OF NEW CASTLE, PENNSYLVANIA.

BOILER.

SPECIFICATION forming part of Letters Patent No. 574,925, dated January 12, 1897.

Application filed January 3, 1896. Serial No. 574,198. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. MEEHAN, a resident of New Castle, in the county of Lawrence and State of Pennsylvania, have invented a new and useful Improvement in Boilers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to boilers, and more especially to certain improvements in what is known to the trade as the "horizontal" type of water-tube boiler.

Referring to the accompanying drawings, Figure 1 is a longitudinal section of a boiler-furnace with my improved boiler contained therein. Fig. 2 is a section on the line 2 2, Fig. 1. Fig. 3 is a section on the line 3 3, Fig. 1, showing the boiler proper without the smoke-flues extending through it. Fig. 4 is an enlarged view of the water-feeding apparatus, and Fig. 5 is an enlarged detail view of the manner of supporting the cross-drum.

Like letters indicate like parts in each of the figures.

The letter *a* designates the walls of the boiler-furnace inclosing the parts of my improved boiler. The letter *b* indicates the grate-bars in the fire-chamber at the front end of the furnace, said furnace being provided with the customary charging and cleaning doors. The tubes *c* are connected up with the legs *d d'* in the ordinary manner, the stay-bolts *e* acting to strengthen said legs. The legs *d d'* are preferably formed of wrought iron or steel bent to the proper form and secured to the wrought-iron drums or enlargements *f f'*. The drums or enlargements *f f'* may be formed integral with said legs, if desired. Openings *d²* are formed in the outer faces of the legs *d d'*, said openings being provided with suitable caps *d³*, whereby upon removing said caps access may be had to the tubes *c* for purposes of cleaning same. The tubes *c* are supported at a slight incline, and the ends of said tubes are expanded into openings in the legs *d d'*, whereby a close connection is obtained.

As stated, the legs *d d'* are connected up with the drums or enlargements *f f'*, communication between said legs and said drums being afforded by means of the openings *f²*. These drums *f f'* extend across the front and rear of the furnace and are supported by the

wrought-steel beams *f³*, the said drums resting in saddles *f⁴ f⁵*. The saddle *f⁵* has interposed between it and the top of the beam *f³* the rollers *f⁶*. By this construction upon the expansion of the tubes connecting the legs and drums the front drum *f* is free to move as the saddle *f⁵* can move over the rollers *f⁶*. In this manner all strain on the legs and drums due to the expansion and contraction is relieved. The drums *f f'* are connected up by the tubes *g*, said tubes entering said drums at a slight curve, so that they converge toward each other on radial lines. In order to provide for the removal and cleaning of the tubes *g*, I construct openings *h* in the front drum *f* at points about opposite to the convergent ends of the tubes *g*, connecting the drums *f f'*.

By having the openings arranged in the manner described one of said openings gives access to several tubes on account of the convergence of said tubes, whereby the tubes may be readily cleaned or removed. In this way only one opening is required for each series of tubes, which is a new and novel feature. These openings *h* are provided with suitable caps or covers *h'*, secured in any convenient manner. The tubes *g* are likewise supported at a slight incline, the drum *f* being slightly higher than the drum *f'*. The drums *f f'* are connected to the longitudinal drums *j j'* by means of the pipes *k k'*.

The longitudinal drums *j j'* may have the smoke-flues *j²* extending through them, or the smoke-flues may be omitted, if desired, and the smoke carried around the drums *j j'*, as shown in Fig. 3. The smoke-flues *j²* communicate with the stack or chimney *j³*.

In order that the products of combustion coming from the fire-chamber may pass in an indirect course through the furnace, I interpose baffle-walls at suitable intervals. The baffle-wall *l* is formed of suitable tiling and is supported chiefly by the cross-wall *a'*. The baffle-wall *l* is made up of several tiles arranged in the following manner: The tiles *l'* are built up on the cross-wall *a'* and are formed in the seats *l²* at the corners, which, when brought into coincidence with each other, form openings for the passage of the tubes *c* and *g*. As there is a larger space between the two sets of tubes *c* and *g*, I em-

ploy the larger tiles l^3 for this space. The baffle-wall m is constructed in the same manner as the wall l , said wall having, however, the additional row of tiles m' , which are supported from behind by the angle-bar m^2 and the depending wall a^2 . By this construction the baffle-walls may be quickly removed to withdraw the tubes and rebuilt again. By this construction the products of combustion

pass up from the fire-chamber over the baffle-wall l , down underneath the baffle-wall m , up and through the flues j^2 to the stack j^3 , whereby the tubes are thoroughly heated at all points.

Within the longitudinal drums j j' are located the mud-depositing drums o , strengthened by the tie-bolts o' . The water-supply pipe p passes through the longitudinal drum and enters the mud-depositing drum o . This mud-depositing drum o has the openings o^2 formed in the top thereof and the baffle-plates o^3 . These baffle-plates o^3 are located in front of each opening and are inclined at an angle therefrom. As the water enters the drum o the baffle-plates o^3 prevent its passing directly through the openings o^2 into the boiler. On the contrary, the water strikes the baffle-plates o^3 and mud or sediment is deposited on these plates, and the water is thus to a certain extent filtered and purified before it passes into the boiler. The mud or sediment drops from the baffles o^3 to the bottom of said drum o , and is carried off by means of the pipe q to the mud-drum r without the furnace-walls.

The mud-drum r is also connected up with the leg d' by the pipe r' , whereby any sediment collecting in said leg is carried off by said pipe r' and the mud-drum r . By this construction, before the water is permitted to circulate through the tubes, a great part of the mud or sediment is deposited, so that the clogging up of the tubes and other parts of the boiler is largely avoided.

The operation of my improved boiler is as follows: Water having been fed thereto until it reaches the proper line within the longitudinal drums, fire is lighted upon the grate-bars b , and as the pipes c and g become heated the circulation of the water is from the drums j j' down through the pipes k' into the enlargement f' and leg d' , thence up through the pipes c and g to the leg d and enlargement f back again to the longitudinal drums. The front cross-drum f permits of the separation of the steam, owing to the said enlargement projecting out beyond the legs and affording a larger space. This separation of the steam in the front cross-drum f is also due to the

fact that said drum is located in the front or hottest part of the furnace. By this construction the area for liberation of steam and water is increased about fifty per cent., while the separation of the steam within the front cross-drum f reduces the ebullition within the longitudinal drums, and a better circulation is obtained. A chamber is furnished intermediate of the front leg and the horizontal drums of such a size as to allow for the expansion and free liberation of the steam. I am able to employ wrought-iron legs riveted to the drums f f' , which has many advantages over any previous formation of boilers for strength and cost of material. At the same time by the use of the enlargements f f' I can do away with a great number of the caps for covering the openings in the legs and am able by the use of the openings in said enlargements to clean and remove a number of pipes by the removal of a single cap.

When it is desired to apply my invention to an old boiler where there is not sufficient space for the cross-drums and the legs, said legs may be omitted.

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

1. In a boiler, the combination of a series of tubes, legs connected by said tubes, cross-drums communicating with said legs and with the main water-drum above, and a second series of tubes connecting said cross-drums, substantially as set forth.

2. In a boiler, the combination of a series of tubes, legs connected by said tubes, a cross-drum interposed between the front leg and the main water-drum above, a series of tubes entering said cross-drum, said last-mentioned tubes having converging ends, said cross-drum having an opening therein at a point opposite the points of entrance of said converging tubes into said cross-drum, substantially as set forth.

3. The combination of a boiler, a closed receptacle contained therein, a supply-pipe leading to said receptacle, said receptacle having openings in the top thereof, baffle-plates adjacent to said openings, a pipe leading from said receptacle to a mud-drum without the furnace-walls, a leg connected to said boiler and a pipe leading from said leg to said mud-drum, substantially as set forth.

In testimony whereof I, the said JOHN J. MEEHAN, have hereunto set my hand.

JOHN J. MEEHAN.

Witnesses:

ERRETT E. PHILLIPS,
JOHN B. BROWN.