

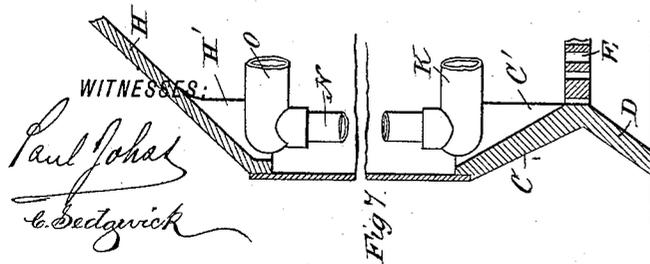
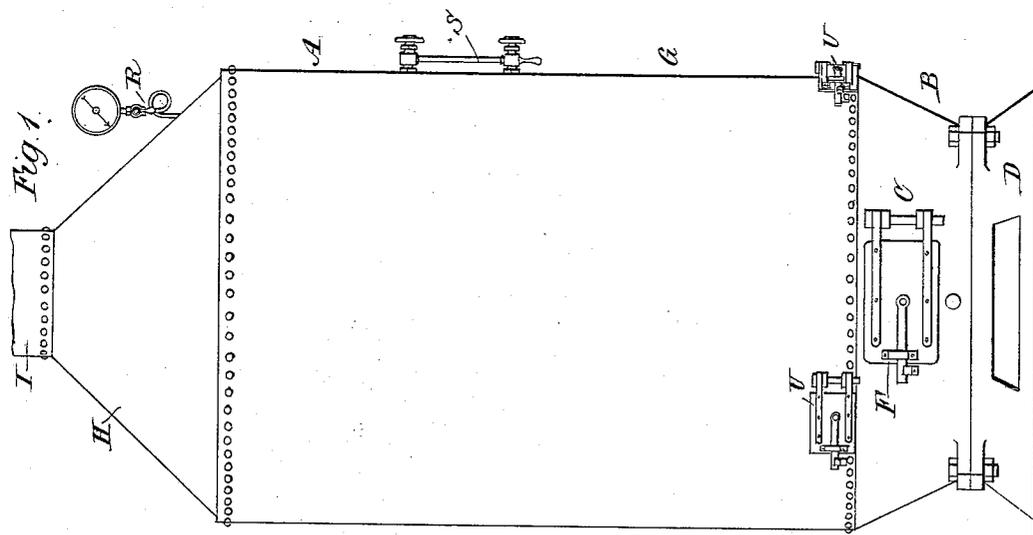
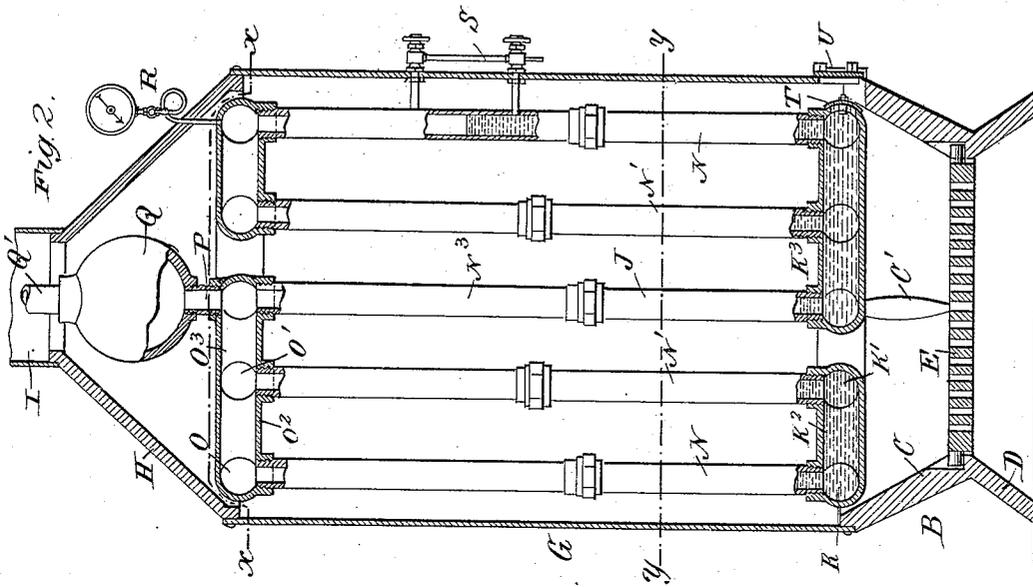
(No Model.)

2 Sheets—Sheet 1.

# J. R. LUTGEN. BOILER.

No. 416,412.

Patented Dec. 3, 1889.



INVENTOR:  
*J. R. Lutgen*  
BY *Munn & Co.*  
ATTORNEYS.



# UNITED STATES PATENT OFFICE.

JAMES R. LUTGEN, OF BROCK, NEBRASKA.

## BOILER.

SPECIFICATION forming part of Letters Patent No. 416,412, dated December 3, 1889.

Application filed July 20, 1889. Serial No. 318,163. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES R. LUTGEN, of Brock, in the county of Nemaha and State of Nebraska, have invented a new and Improved Boiler, of which the following is a full, clear, and exact description.

The invention relates to sectional boilers; and its object is to provide a new and improved boiler which is very simple and durable in construction and effective in getting up steam rapidly, at the same time being very safe and reliable.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of the improvement. Fig. 2 is a sectional side elevation of the same. Fig. 3 is a plan view of the same. Fig. 4 is a sectional plan view of the same on the line *xx* of Fig. 2. Fig. 5 is a like view of the same on the line *yy* of Fig. 2. Fig. 6 is a plan view of the base, and Fig. 7 is a sectional side elevation of the improvement.

The improved boiler A is provided with a base B, preferably made of the two parts C and D, of which the former forms the fire-box and contains in its bottom the grate-bars E, of any approved construction. The part C is also provided with the usual door F for the admission of the fuel to be burned on the grate-bars E. The lower part D of the base B forms the ash-pit.

On the upper end of the base B is secured the outer shell G, supporting on its upper end the cap H, carrying the smoke-stack I. In the outer shell G is held the sectional water-pipe J, provided with an outer circular base-pipe K, resting on suitable lugs C', cast on the inside of the part C of the base B. A concentric pipe K' is connected with the exterior pipe K by arms K<sup>2</sup>, every alternate one of which is continued and leads from the inner pipe K' to the center of the same, as is plainly shown in Fig. 5. Into the exterior pipe K leads the water feed-pipe L, connected with a suitable source of water-supply.

From the outer pipe K extends upward a

series of pipes N, preferably made in two or more sections and supporting at their upper ends a circular pipe O, similar to the base-pipe K. From the concentric pipe K' lead the pipes N', connected at their ends with a circular pipe O', held concentric to the exterior pipe O and connected with the same by pipes O<sup>2</sup>, as is plainly shown in Fig. 4. From the concentric pipe O' lead inward the pipes O<sup>3</sup>, meeting in the center of the pipe O' and connected with the pipes K<sup>3</sup> by a central vertical pipe N<sup>3</sup>.

From the center of the pipes O<sup>3</sup> extends upward a short pipe P, leading into the steam-dome Q, held in the cap H and preferably of spherical form, as is plainly shown in Fig. 2. The steam-outlet pipe Q' leads from the steam-dome Q, passing upward partly through the chimney I.

A steam-gage R is connected with the top of the outer circular pipe O, and a water-glass S is connected with one of the pipes N near its middle, as is plainly shown in Fig. 2. The upper circular pipe O is held in place by suitable lugs H', projecting from the inside of the cap H, as is plainly shown in Fig. 7.

In the lower circular pipe K are formed a number of hand-holes T, adapted to be reached from the outside through suitable doors U, held on the lower part of the exterior shell G. The hand-holes T serve for cleaning the sediment out of the bottom circular pipes K, K', K<sup>2</sup>, and K<sup>3</sup>.

When the fuel on the grate-bars is burning and the pipes K, K', K<sup>2</sup>, and K<sup>3</sup> and parts of the pipes N, N', and N<sup>3</sup> are filled with water, the heat generated will quickly heat the water and transform it into steam, which will pass up into the circular pipes O O', and from the latter by the short pipes O<sup>2</sup> to the central pipe P, leading to the steam-dome Q. It will be seen that the heat passing upward surrounds the upper part of the sectional pipe J, containing the steam, so that the steam is superheated before the smoke and gases pass up through the cap H into the chimney I.

A boiler constructed in the manner shown and described is very strong and will stand a high pressure, at the same time taking up very little room. It will further be seen that the danger of explosions is greatly lessened on account of the steam and water being

equally divided, and a bursting or fracture of one of the sections of one of the pipes J will not allow the steam to escape instantly, as it would be confined within the exterior shell G.

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

1. A boiler comprising the base B, provided with a grate E, the cap H, the shell G, connecting the base and cap, the lower connected concentric pipes supported on the upper end of the base, the upper connected concentric pipes, a series of vertical pipes within the shell connecting the upper and lower concentric pipes, and a steam-dome Q within the cap H, connected with said upper pipes and provided with a steam-outlet, substantially as set forth.

2. In a boiler, a sectional water-pipe comprising concentric horizontal base-pipes connected with each other, upright pipes set in the said base-pipes, concentric top pipes ar-

ranged horizontally and connected with the upper ends of the said upright pipes, short pipes extending inward from the inner concentric top and base pipes, and a vertical pipe connecting the said short pipes with each other, substantially as shown and described.

3. In a boiler, a sectional water-pipe comprising concentric horizontal base-pipes connected with each other, upright pipes set in the said base-pipes, concentric top pipes arranged horizontally and connected with the upper ends of the said upright pipes, short pipes extending inward from the inner concentric top and base pipes, a vertical pipe connecting the said short pipes with each other, and a steam-pipe leading from the short top pipes and connected with the steam-dome, substantially as shown and described.

JAMES R. LUTGEN.

Witnesses:

B. M. CAMPBELL,  
F. W. YOUNG.