

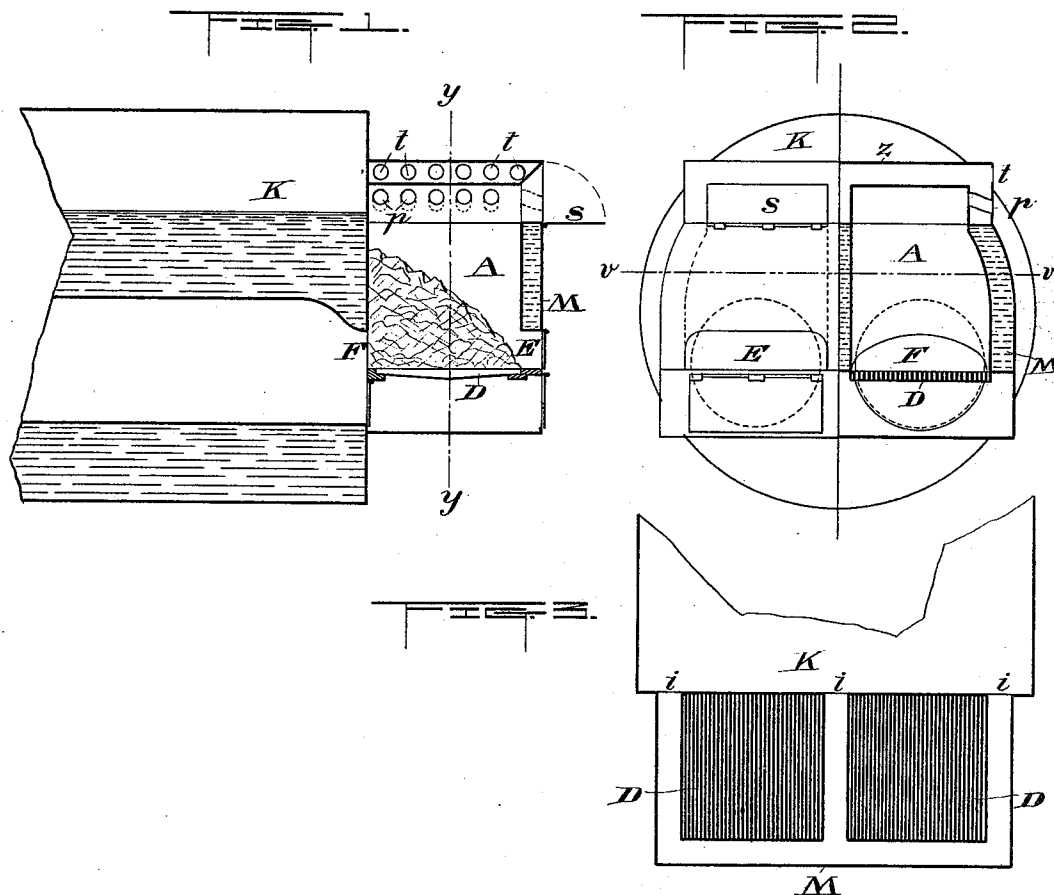
(No Model.)

3 Sheets—Sheet 1.

R. MÜLLER.
BOILER AND FURNACE.

No. 520,569.

Patented May 29, 1894.



Witnesses.
Robert Hammond
George Barry

Inventor.
Rudolf Müller
by attorneys
Robert C. Howard

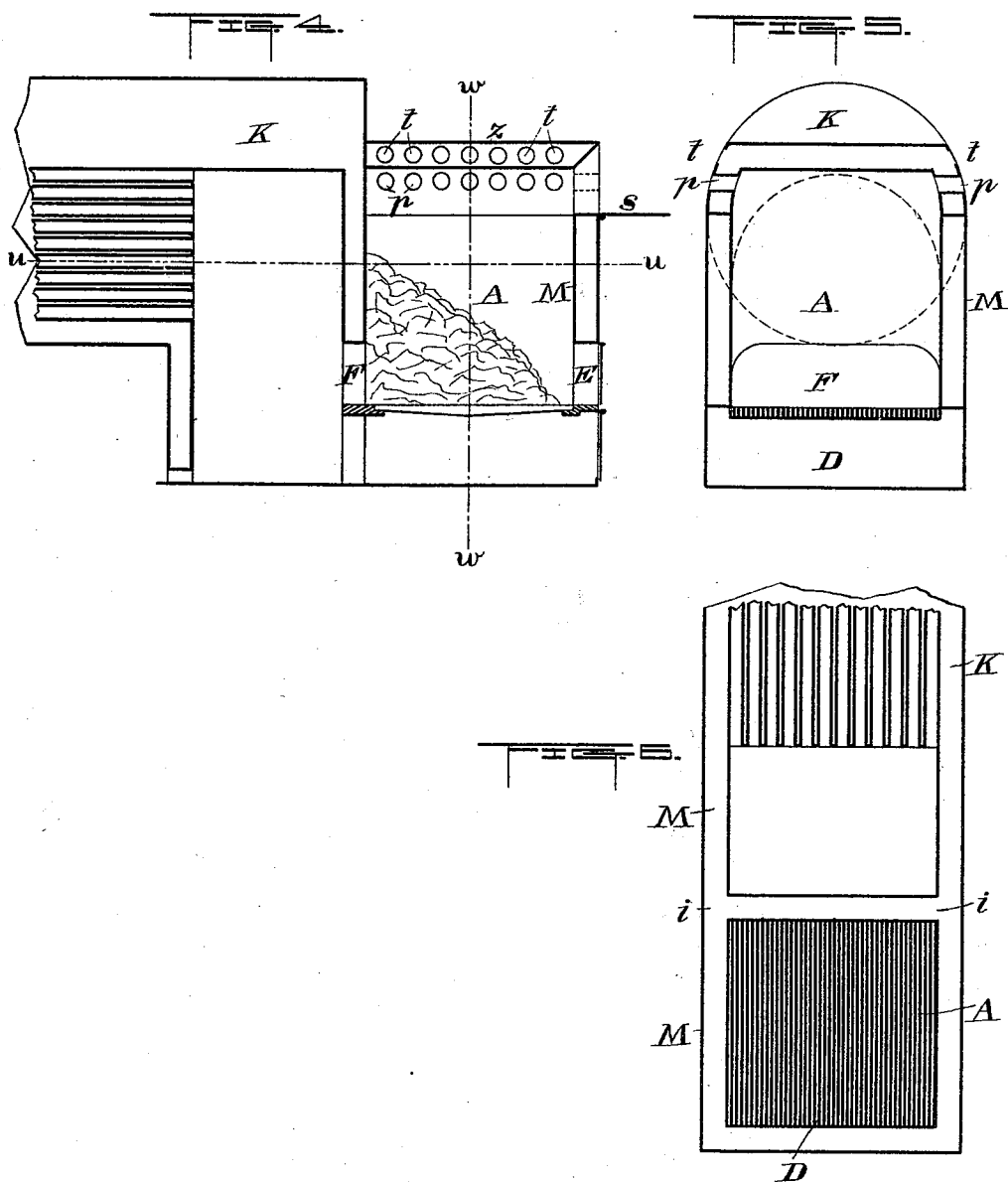
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3 Sheets—Sheet 2.

R. MÜLLER.
BOILER AND FURNACE.

No. 520,569.

Patented May 29, 1894.



Witnesses.
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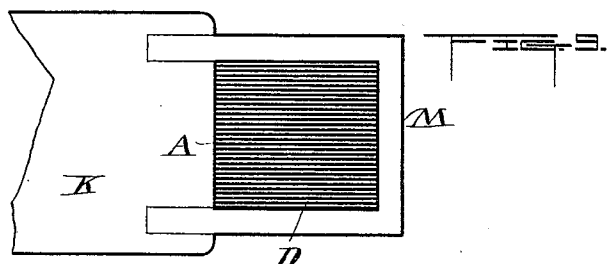
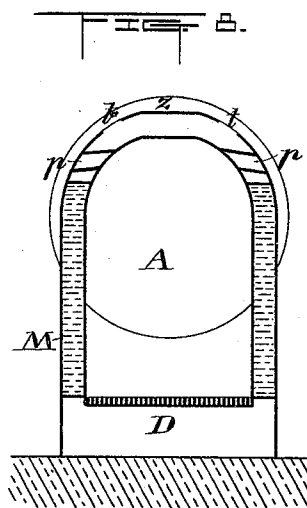
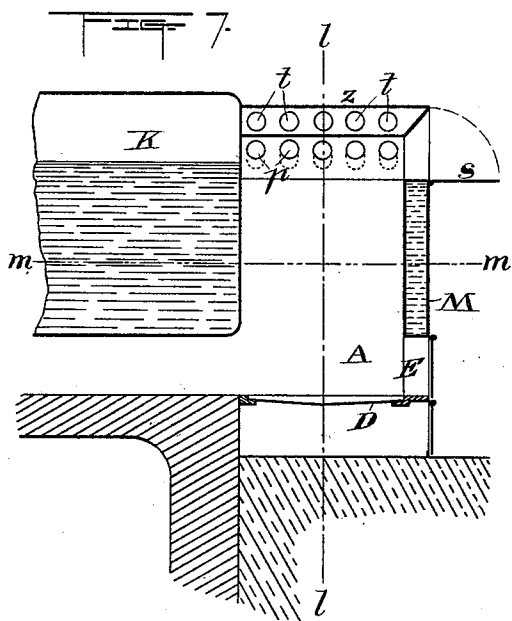
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3 Sheets—Sheet 3.

R. MÜLLER.
BOILER AND FURNACE.

No. 520,569.

Patented May 29, 1894.



Witnesses.

Robert Baumgardner
George Barry

Inventor.
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UNITED STATES PATENT OFFICE.

RUDOLF MÜLLER, OF HAMBURG, GERMANY, ASSIGNOR TO MAXIMILIAN BERENDT, MAX DU ROI DROEGE, ERNST HADENFELDT, AND JOHANNES SEMLER, OF SAME PLACE.

BOILER AND FURNACE.

SPECIFICATION forming part of Letters Patent No. 520,569, dated May 29, 1894.

Application filed June 30, 1893. Serial No. 479,212. (No model.)

To all whom it may concern:

Be it known that I, RUDOLF MÜLLER, of the city of Hamburg, in the German Empire, have invented a new and useful Improvement in Boilers and Furnaces Therefor, of which the following is a specification.

This invention relates to boiler furnaces and its special purpose is to afford complete combustion of the fuel and to remove or prevent smoke by burning it away.

The improved boiler furnace substantially consists of a double wall or mantle or jacket surrounding a fire chamber, the latter being closed below by a grate on which the fuel rests and provided above with a cooling cap or cover, the latter serving to prevent the radiation of the heat developed. The interval between the double walls directly communicates with the interior of the boiler and the outlet opening through which the flames and gases pass to the flues or flame tube or tubes of the boiler is immediately above the aforesaid grate. The combustion takes place in such a way that the air entering above passes down through the fuel which latter is also supplied from above, into the combustion-zone which lies directly in front of the outlet opening. The grate only serves as a fuel bed and air is not supplied through it or at least only in a very insignificant degree.

The annexed drawings show four different examples of the invention respectively in the Figures 1 to 3, 4 to 6, 7 to 9 and 10 to 12.

Fig. 1 represents a longitudinal section through the furnace and the front portion of its boiler. Fig. 2 is a front view corresponding with Fig. 1, partially in section on the line *yy* of Fig. 1. Fig. 3 represents a horizontal section on the line *vv* of Fig. 2. Fig. 4 shows a longitudinal sectional view through the furnace and the front end of a locomotive boiler. Fig. 5 represents a transverse section on the line *ww* of Fig. 4. Fig. 6 is a horizontal section on the line *uu* of Fig. 4. Fig. 7 represents a longitudinal section through the furnace and the front end of a plain cylindrical or of a saddle boiler. Fig. 8 shows a front view in section on the line *ll* of Fig. 7. Fig.

9 is a horizontal section on the line *mm* of Fig. 7.

Similar letters of reference designate corresponding parts in all the figures.

K in all cases represents the main boiler and A a fire chamber which laterally and in front is surrounded by a double mantle or jacket M. The interval between the walls of the jacket M directly communicates with the interior of the main boiler K so that the water in the boiler through diaphragms *i* communicates with and fills both. The fire chamber A is closed below by a grate D beneath which is the ash-pit inclosed on all sides by walls. On the front side below the double jacket an open space is left provided with a cleaning door E and the double jacketed fire chamber A is closed above with a double-walled cover *z* in which there are air inlet openings *p* and *t*. This cover serves at the same time to prevent the radiation of heat. Through the openings *p* air enters the fuel lying upon the grate and through the openings *t* air circulates in the cover. The latter serves for keeping the cover sufficiently cool.

s is an orifice in the cover serving for introducing the fuel. At the rear end of the fire chamber A, close above the grate D, the outlet opening F for the fire gases is arranged, the fuel being intended to be heaped in such a manner upon the grating that it covers completely this opening F, so that no cold air is allowed to pass to the flues of the boiler but such air must first pass through the fuel before it arrives at the gas-developing-zone, the latter lying at the opening F.

In Figs. 1 to 3 where a furnace arrangement for a boiler with two tubes is shown, the fire chamber A is divided in the middle by a cross wall, being a part of the double jacket M communicating through orifices *i* with the boiler K.

In Figs. 4 to 6 and Figs. 7 to 9 the same letters represent similar parts; only instead of the flame tube boiler K (Figs. 1 to 3) in Figs. 6 to 8 a locomotive boiler K and in Figs. 7 to 9 a boiler K firing from beneath is illustrated.

What I claim as my invention is—

The combination with the main boiler K, of a boiler furnace constituted by a fire chamber A having air inlets in its upper part and having its sides and front inclosed by a double jacket which forms a water space communicating with the main boiler, the said fire chamber having a grate D at its bottom, and the flame outlet F from the said fire chamber being arranged immediately above the grate that it may be kept covered by the fuel thereon, substantially as herein set forth.

RUDOLF MÜLLER.

Witnesses:

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