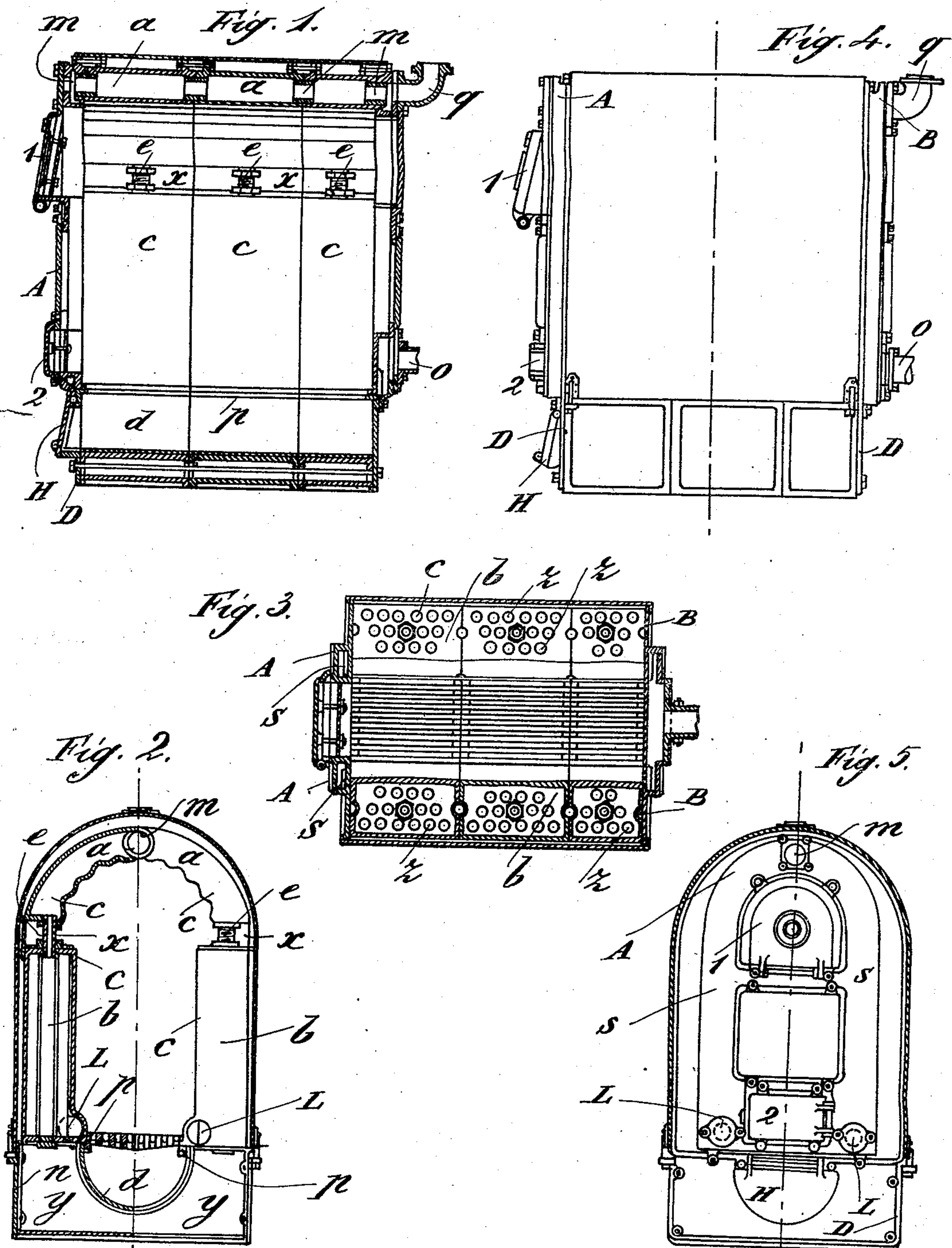


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HOT WATER BOILER.  
APPLICATION FILED JAN. 21, 1908.

929,496.

Patented July 27, 1909.



Witnesses  
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# UNITED STATES PATENT OFFICE.

ENRICO ROGGERO, OF GENOA, ITALY.

## HOT-WATER BOILER.

No. 929,496.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed January 21, 1908. Serial No. 411,981.

*To all whom it may concern:*

Be it known that I, ENRICO ROGGERO, a subject of the King of Italy, residing at No. 28 Via XX Settembre, Genoa, in the Kingdom of Italy, manufacturer, have invented new and useful Improvements in Hot-Water Boilers, of which the following is a specification.

The present invention relates to a new hot water boiler which is shown in the accompanying drawings, where—

Figure 1 is a longitudinal section, Fig. 2 is a transverse section, Fig. 3 is a plan from above partly in section, Fig. 4 is a side view, Fig. 5 is a front view.

It is composed of: two or more complex sections *c*, two front plates A and B, and a base D which acts as smoke box. Each complex section is composed of: the two tube cases *b*, the collecting dome *a*, and the connecting arch *d*, which also forms the ash pit. The two tube boxes *b* consist of parallelipipeds of cast-iron which inside are hollow and crossed by bundles of tubes calked at their ends into the end plates of the tube boxes. The tubes cross the tube boxes in the direction of their length, viz. vertically. The two tube boxes by means of the nipples *e* are connected with the collecting dome *a*. The semi-circle of cast-iron *d* fixed by means of pins to the lower part of the tube boxes closes or rather completes the section and forms the ash-pit. Each tube box carries at the end a small projecting flange *p*, on which rests a grate. The dome *a* as well as the two tube boxes *b* are provided with holes *m* and L with conical walls, which holes serve for connecting with each other several sections as well as the corresponding front plates by means of bi-conical nipples. Every complex tube section *c*, composed as described, forms an element of the boiler.

The front plate A has the doors 1 and 2 and is provided with the holes L L and *m*, which exactly correspond with the holes similarly lettered of the two tube boxes and the collecting dome and serve for placing in communication the water chamber *s* having the shape of a horse-shoe with the above mentioned parts of the complex tube sections. The holes L L and *m* serve also for admitting and discharging the water. A number of sections joined together and put in communication by means of bi-conical nipples as described, closed at the ends by the two front plates A and B, resting on the base

D and covered laterally by non-conducting material protected by a thin iron sheet, forms a complete boiler of the kind described.

The base is provided with the door H which serves for cleaning the ash-pit. It will be noticed that with each section of the boiler mounted in this way that between the collecting dome *a* and the tube boxes a space *x* is left, and that the section resting on the base forms the closed chamber *y*, where the lower ends of the tubes are inserted.

Now the circulation of the furnace gases and the combustion take place in the following way. The space between the two tube boxes *b* is filled with lighted coal up to about the height of the door *l*, which serves for introducing the fuel; the combustion gases passing through the space *x* flow into the tubes *z* (Fig. 3) which lead them to the smoke box *y*, from where they pass into the chimney which can be connected with any of the walls of the base according to the local conveniences. The water enters through the hole *o*, circulates in all the elements by means of the joints L L and *m* and being heated gradually rises to the collecting dome *a*, from where it is discharged through the hole *q*, in order to be distributed in the single radiators, heating coils, bath tubs and the like. Each couple of tube boxes *b* could be obtained by casting and be integral with the smoke-collector *y* which connects two by two the tube boxes, one of which situated on one side and the other one on the other side of the fuel chamber.

Having now fully described this my invention and how the same is to be carried out, what I claim is:

1. A hot water boiler, in which the central fuel chamber placed above the grate is inclosed along the two vertical sides between tube-boxes with smoke-tubes the interstices between the tubes forming a water space, each tube communicating below with a smoke-collector disposed below the said fuel chamber and the water space communicating above with a water collector from which the water passes to the place of consumption, the said boxes as well as the collectors consisting of adjacent elements joined together in a suitable number.

2. In a hot water boiler of the character described the elementary transverse sections consisting of two boxes of smoke-tubes opposite to each other provided at the

base with projections destined for support-  
ing the grate, a smoke collector in which  
open the tubes of the tube boxes at their  
lower ends, a water collector with which  
5 communicates the water space of the boxes,  
and a smoke space between the water col-  
lector and the boxes.

In testimony whereof I have signed my  
name to this specification in the presence of  
two subscribing witnesses.

ENRICO ROGGERO.

Witnesses:

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