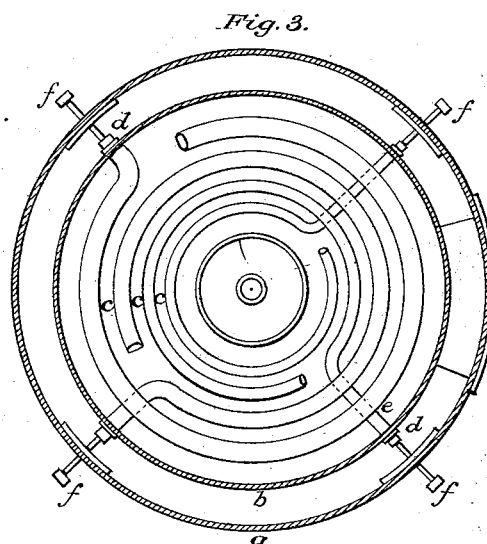
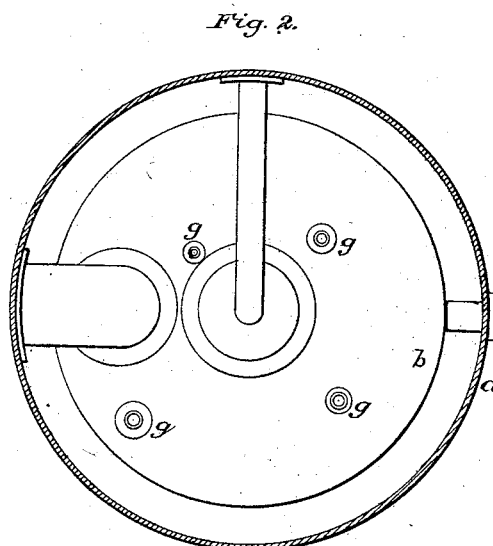
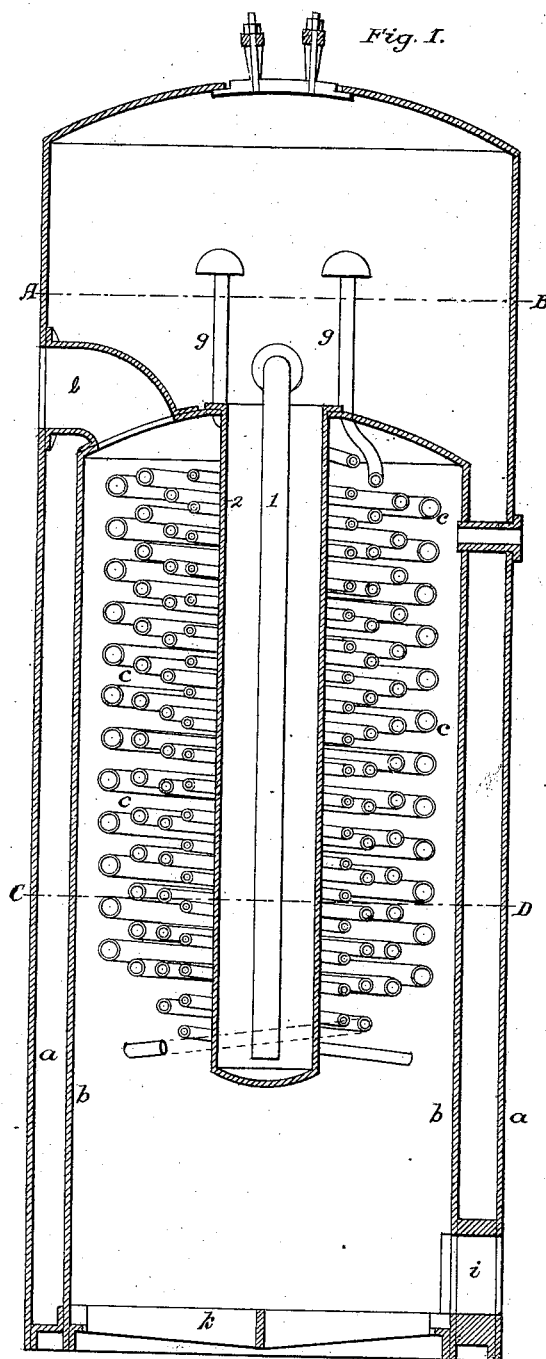


A. GILLITZER.

Steam-Boiler.

No. 221,049.

Patented Oct. 28, 1879.



Attest:  
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Inventor:  
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Fig. 4.

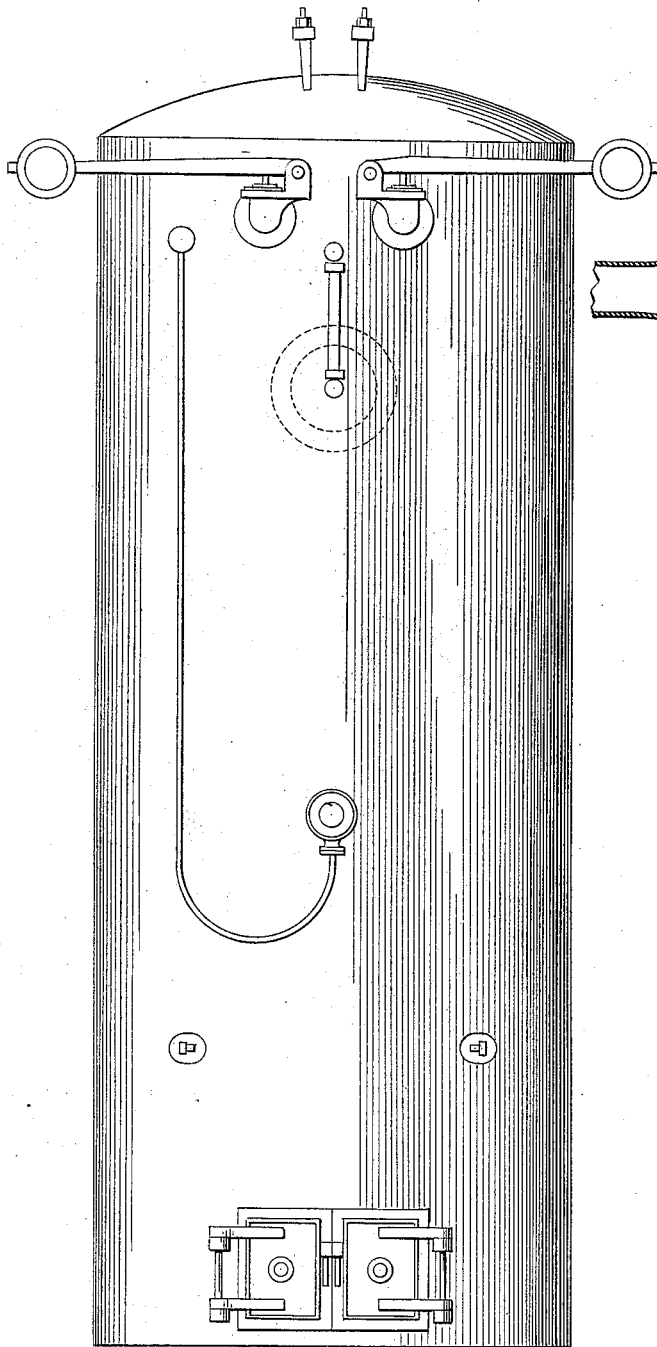


Fig. 5.

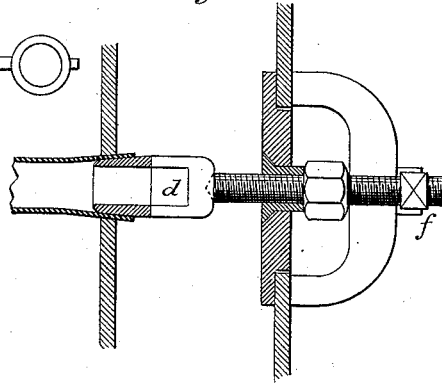


Fig. 6.

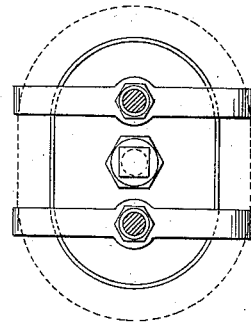


Fig. 7.

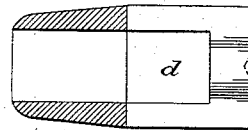
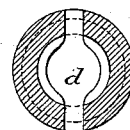


Fig. 8.



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# UNITED STATES PATENT OFFICE.

ADALBERT GILLITZER, OF FÜNFKIRCHEN, AUSTRO-HUNGARIAN EMPIRE.

## IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. **221,049**, dated October 28, 1879; application filed August 7, 1879.

*To all whom it may concern:*

Be it known that I, ADALBERT GILLITZER, civil engineer, of Fünfkirchen, in the Austro-Hungarian Empire, have invented a new and useful Improvement in Steam-Boilers, which improvement is clearly and fully set forth in the following specification.

My invention can be applied to existing steam-generators as well as to new ones, and can be used in connection with stationary and locomotive engines, with marine engines, and generally in all cases where steam is used. It is called "the system of universal steam-boilers."

The universal application of my improved boiler is owing to the simplicity of construction, to the regularity of working, and to the easiness of inspection and cleaning without dismounting the boiler and its tubes. Being made of cylindrical shape they admit of a very great tension of steam, (ten to twenty atmospheres.) The costly brick-work and high chimneys commonly used for stationary engines may be dispensed with, an ordinary house-chimney being in general sufficient for the operation of large boilers.

In the accompanying drawings, which form a part of this specification, Figure 1 is a vertical section of a boiler constructed in accordance with my invention; Fig. 2, a horizontal section on line A B; Fig. 3, a horizontal section on line C D, Fig. 4, a front view, and Figs. 5, 6, 7, and 8, detail views on enlarged scales.

Two cylinders, *a b*, with dome-shaped tops connected together constitute the body of the boiler. A water-space is formed between them. The form and relative proportions of the two cylinders are shown in Fig. 1. From the top of the cylinder *b* a small cylinder, 2, with closed bottom, is suspended. This cylinder 2 opens into the water-space, and a pipe, 1, leading from without the boiler extends nearly to the bottom thereof. Between the cylinder 2 and the cylinder *b* is a series of spiral pipes, *c*, which open at the points *e* into the water-space, and at the other end terminate in education-pipes *g*, which extend into the steam-space about ten centimeters above the highest water level of the boiler. Below the tubes *c* is the fire-grate *k*, to which access is had through

the door *i*. The products of combustion pass off through *l* to the chimney. The steam-tightness of the joints which the tubes *c* make with the walls of the cylinder *b* is effected by means of hollow plugs *d*, Figs. 3, 5, 7, and 8, operated from without through the screws *f*, which pass through the lid of the man-hole. The tightening of the joints can therefore be effected without interrupting the working of the machine.

The construction and arrangement of the several parts are best seen in Fig. 5.

The boiler is also provided with a water-level, manometer, and safety-valves, as shown in Fig. 4, as is usually the case in steam-boilers.

In operation water is fed through the pipe 1. It fills the cylinder 2, overruns into the water-space between the cylinders *a b*, and then rises in the pipes *c* till the proper level is reached. The flames and hot gases passing through the pipes *c* generate steam, which escapes through the pipes *g* into the upper part of the cylinder *a* or steam-dome. Dry steam is thus supplied. As fast as the water evaporates a fresh supply is furnished from the water-space. If any leakage takes place at the points *e* the hollow plugs *d* are tightened by the screws *f*, as before explained. The boiler can be emptied when desired, by means of suitable blow-off cocks.

In order to clear the tubes *c* the plugs *d* are removed, when access is had to their end through the man-holes.

The heating-surface obtained by the arrangement described is very great in comparison with the small size and weight of the apparatus, which is capable of resisting great pressure. All kinds of fuel may be employed.

The system of water-circulation effectually prevents sediment and incrustation in the steam-tubes.

Modifications may be made in the boiler without departing from the spirit of my invention—for example, in the number and arrangement of the tubes. Any number may be employed. They may be connected with the water-space at the same or at different levels, and it is not necessary that they should all be coiled alike.

I regard the construction shown and de-

scribed as the best for boilers of small dimensions. In larger boilers the hearth is placed in the interior of the cylindrical body.

Having thus fully described my invention, and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is as follows:

1. The combination, with the body of the boiler with double walls forming a water-space, of a cylinder open at the upper end, closed at the lower end, suspended in the fire-box, and communicating with the water-space, an inlet-pipe extending from outside the boiler to near the bottom of said cylinder, and a series of pipes connected at their lower ends with the water-space extending spirally around the aforesaid cylinder, substantially as described.

2. In a steam-boiler, the means for effecting the steam-tightness of joints of the tubes, consisting of a hollow tapered plug and tightening-screw, substantially as described.

3. The combination, with the water-space of a steam-boiler, of a tube fitting in a hole in one wall of said space, a tapered plug fitting in the open end of said tube, and a screw passing through the other wall of the water-space and bearing against the outer end of said plug, substantially as described.

4. A steam-boiler having double walls with a water-space between them, and a series of tubes connected at their lower end with such space, and provided with means for making tight such connection and for exposing the open ends of the tubes, the said means consisting of a tapered hollow plug, a man-hole with a lid, and a screw passing through said lid and pressing against said plug, substantially as described.

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