

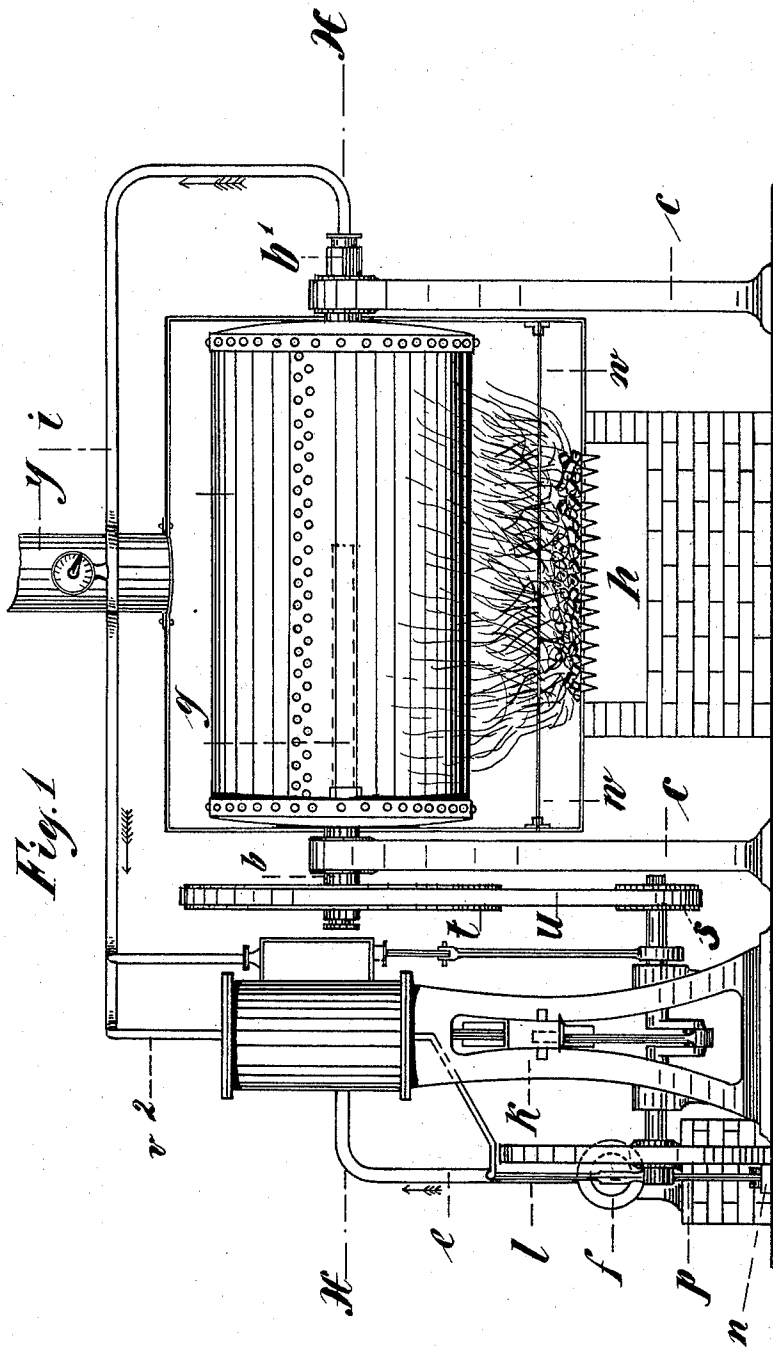
(No Model.)

3 Sheets—Sheet 1.

P. TRETIN.
STEAM BOILER.

No. 585,723.

Patented July 6, 1897.



Witnesses:
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Karl E. Detmer.

Inventor
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by his attorney:
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(No Model.)

3 Sheets—Sheet 2.

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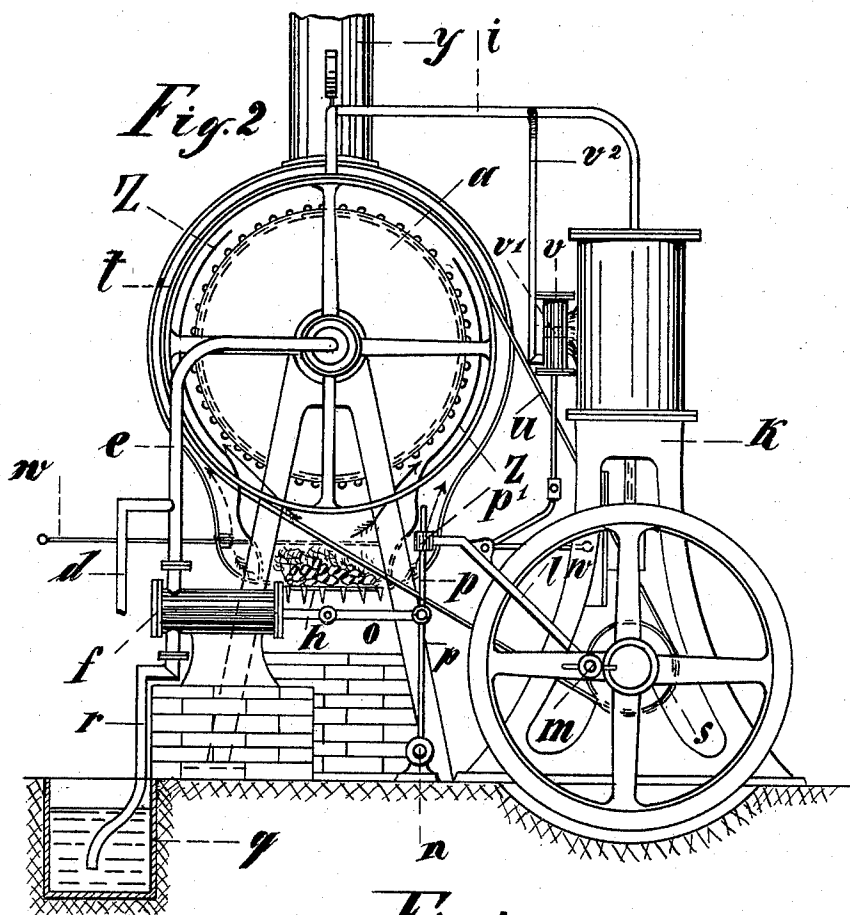


Fig. 2.

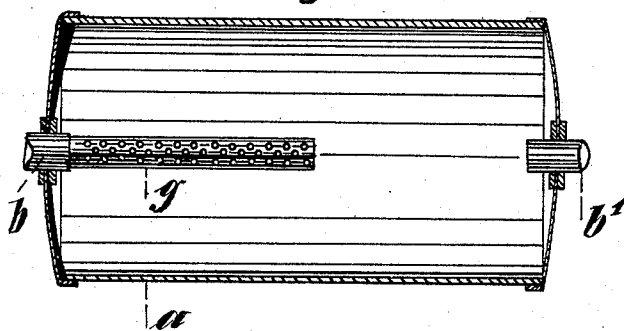


Fig. 4.

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(No Model.)

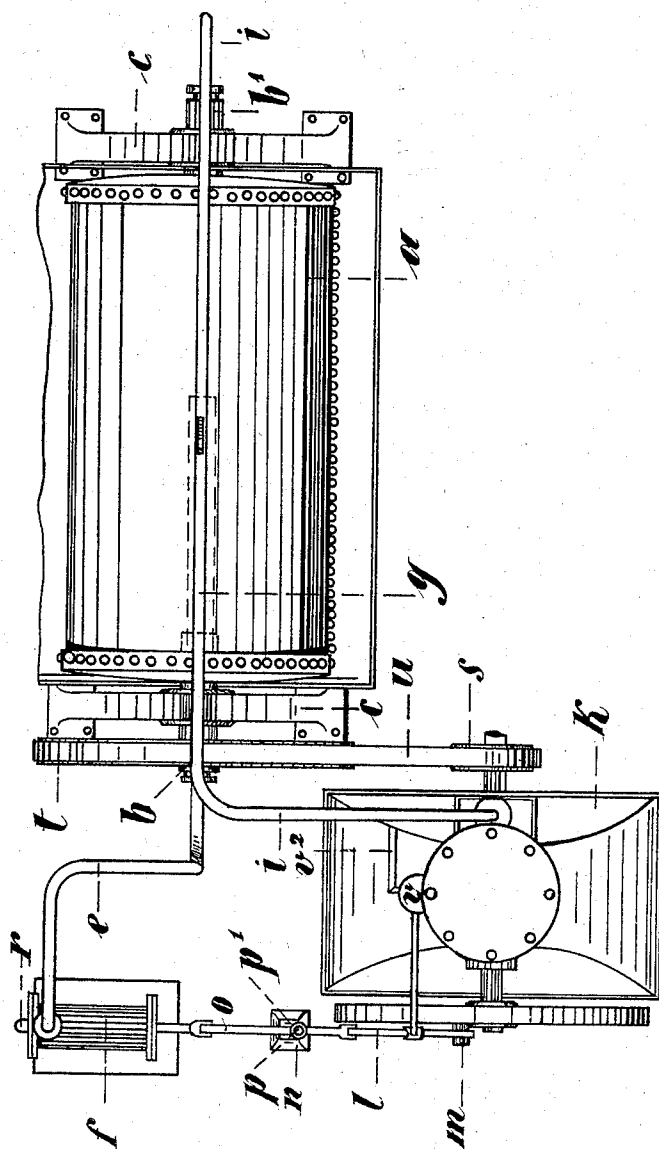
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Fig. 3.



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UNITED STATES PATENT OFFICE.

PAUL TRETTIN, OF BERLIN, GERMANY.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 585,723, dated July 6, 1897.

Application filed October 26, 1895. Serial No. 567,021. (No model.)

To all whom it may concern:

Be it known that I, PAUL TRETTIN, machine-maker, of 11 Schinkestrasse, Berlin, in the Kingdom of Prussia, German Empire, have invented new and useful Improvements in Steam-Boilers, of which the following is a specification.

This invention relates to a rotating steam-boiler into which the water is injected in a subdivided condition to be immediately converted into steam. In this boiler the presence of a quantity of water rising to a definite level, which is absolutely necessary in steam-boilers of the ordinary construction, is completely avoided, and the boiler consequently possesses the advantage over ordinary boilers that in a very short time after the application of heat enough steam is generated to set in motion the engine to which it is connected. The pump for injecting the water into the boiler may be operated by the same engine that receives steam from the boiler, or by other means, if preferred.

The accompanying drawings show a boiler constructed in accordance with the invention and connected with a steam-engine. They also show a pumping apparatus for supplying the water to the boiler.

Figure 1 is a side view, partly in section; Fig. 2 a front view, Fig. 3 a plan, and Fig. 4 a section, of the boiler, taken on the line $x x$ of Fig. 1.

The boiler a , which is of simple cylindrical form, is provided at both ends with trunnions $b b'$, which turn in bearings on the frames $c c$, and it may be made of the usual materials, such as steel or iron, for example.

When starting the boiler to work, water is at first injected into it by means of a hand-pump (not shown in the drawings) connected to the pipe d , which leads to the delivery-pipe e of the mechanically-operated feed-pump f . The water passes from the pipe e through the hollow trunnion b and pipe g , which latter is perforated with a number of small holes, and is thus delivered in a subdivided state into the boiler a , which is heated by the furnace h . This water is immediately converted into steam on coming in contact with the hot walls of the boiler, and this steam passes off through the hollow trunnion b' and steam-pipe i to the

valve-chest of the steam-engine k and sets the latter in motion in the usual way.

When the engine k is in motion, it operates the feed-pump f by means of the connecting-rod l , the stroke of the piston of the pump f being increased or diminished by adjusting in its slot the crank-pin m , onto which one end of the rod l takes, and by varying the point of connection of the other end of the rod l with the lever-arm p , pivoted in a bearing n and connected to the piston-rod of the pump f by the connecting-link o . When the engine is in motion, the hand-pump can be put out of action and the supply of water to the boiler by the feed-pump f goes on automatically.

The pump f is to be so regulated that it supplies exactly as much water to the boiler as the latter is capable of immediately converting into steam by the heat received by it from the furnace. The water is drawn by the pump f from the reservoir q through the suction-pipe r and is supplied to the boiler through the pipe e , as before explained. This accurate adjustment of the quantity of water to the evaporative power of the boiler prevents the accumulation of water in the latter. If, however, the pressure in the boiler should become too high or too low, it is reduced or increased as quickly as possible to the normal pressure by means of a piston v' , fitted into a cylinder v and moved up or down therein according to the pressure in the boiler. This piston v' is jointed to the connecting-rod l .

As the steam-pipe v^2 opens into the cylinder v below the piston v' the latter is raised by an increasing pressure in the boiler, and rod l , which is connected with the lever p by means of an adjustable guide p' , is moved upward also, whereby the stroke of the pump f is reduced, and the pressure in the boiler is reduced in consequence of the reduction of the quantity of feed-water supplied to it. If the pressure in the boiler is too low, the piston v' falls, the connecting-rod l is moved downward, the stroke of the pump f is increased, more water is introduced into the boiler, and consequently the pressure is raised again to its normal degree.

If from any unforeseen cause the pressure in the boiler rises too high and the fire in the furnace is at the same time too active, the

boiler *a* can be protected from the action of the hot gases by covering the fire with the dampers *w w*, whereby the gases are diverted and led around outside a protecting-plate *z*, fixed at a certain distance from and around the boiler-shell, but inside the outer casing, so that they pass off by the chimney *g* without touching the boiler *a*.

The boiler *a* is kept in constant rotation by means of a pulley *s*, fixed on the crank-shaft of the engine *k*, and another pulley *t*, fixed on the trunnion *b*. These pulleys are connected by means of a driving-belt *u*.

By the arrangements above described not only is the shell of the boiler *a* uniformly heated, which is of material advantage in the formation of steam, but it is subjected to a minimum of wear because it is uniformly heated in all its parts.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

In a rotating steam-boiler the combination

of the boiler provided at both ends with hollow trunnions and a perforated pipe arranged inside and connected to the one of the hollow trunnions with a steam-engine jointed to the boiler by a pipe passing from the other of the hollow trunnions, a feed-pump connected with the said perforated pipe inside of the boiler, a rod adapted to be operated by the steam-engine and operating the feed-pump, a lever pivoted in a bearing and adjustably connected with the said rod and jointed to the piston-rod of the feed-pump, a cylinder being provided with a piston moved up and down according to the pressure in the boiler and jointed to the said operating-rod of the feed-pump, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

PAUL TRETTIN.

Witnesses:

W. HAUPT,

CHAS. KRÜGER.