No. 786,761. PATENTED APR. 4, 1905.

C. E. HASTINGS.

STEAM GENERATOR.

APPLICATION FILED JAN. 6, 1904.

Fig 1.

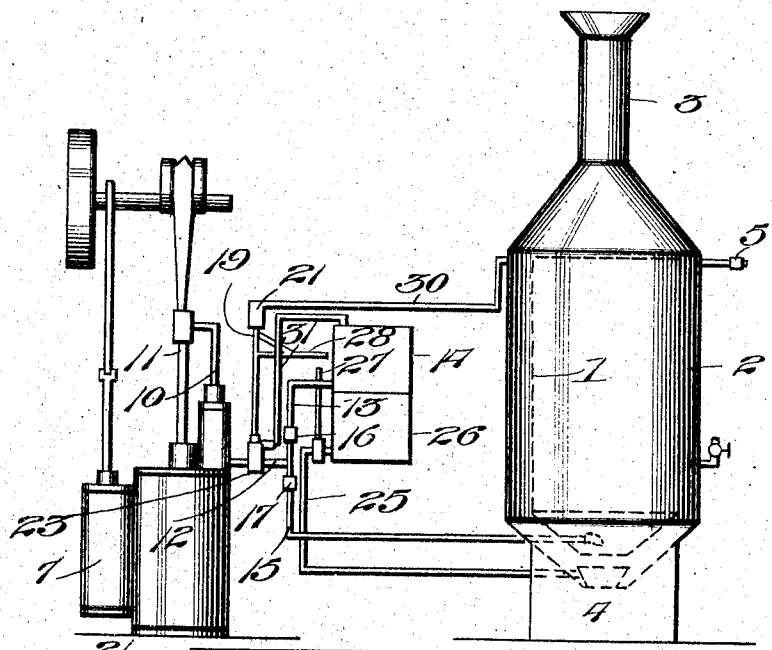
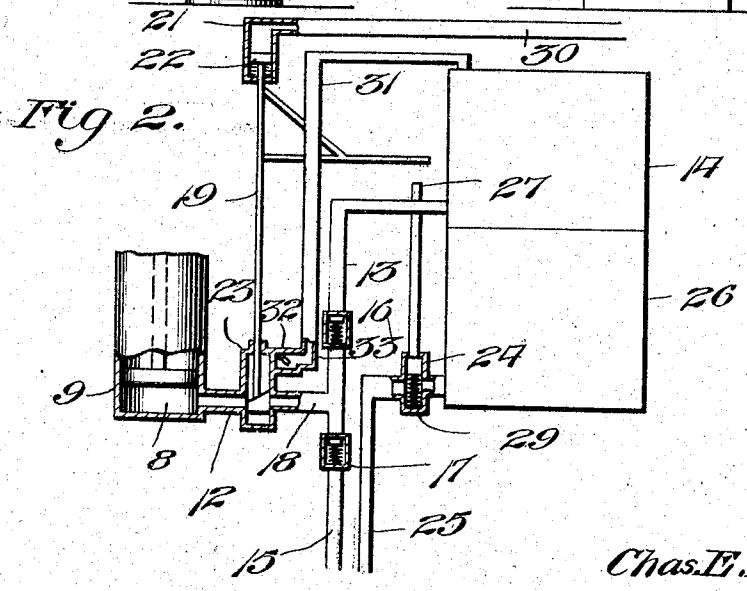


Fig 2.



Witnesses

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No. 786,761. Patented April 4, 1905.

UNITED STATES PATENT OFFICE.

CHARLES E. HASTINGS, OF GRIFFIN, CALIFORNIA.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 786,761, dated April 4, 1905.

Application filed January 6, 1904. Serial No. 187,945.

To all whom it may concern:

Be it known that I, CHARLES E. HASTINGS, a citizen of the United States, residing at Griffin, in the county of Ventura and State of California, have invented new and useful Improvements in Steam-Generators, of which the following is a specification.

My invention relates to new and useful improvements in steam-generators, and its object is to provide an automatic cut-off whereby water and the fuel supplied to the generator may be regulated in proportion to the pressure of steam produced.

The invention consists of a boiler of novel construction, having a steam-pipe connecting it with a cylinder in which is arranged a spring-pressed piston. This piston is connected to a valve located within a valve-casing, which communicates with a pump-cylinder, and an engine is provided for driving said pump. An oil and a water tank are located adjacent the pump and have tubular connections with the boiler and the burner thereunder, respectively, and a valve is arranged within the oil-outlet and is adapted to be operated automatically subsequent to the operation of cutting off the supply of water to the boiler.

The invention also consists in the further novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is a front elevation showing diagrammatically the apparatus constituting my invention. Fig. 2 is an enlarged section through the pump-cylinder and the valves.

Referring to the figures by numerals of reference, 1 is a boiler having a jacket 2 thereabout, and a stack 3 extends from the jacket, while at the lower end of said jacket and below the boiler 1 is located a burner 4 of any suitable construction. A safety-valve 5 is connected to the boiler, and a water-inlet 6 is also provided therefor. An engine 7 is arranged adjacent the boiler and a pump-cylinder 8 is connected thereto and has a piston 9 therein, which is operated by a rod 10, connected to the piston-rod 11 of the engine. An outlet-pipe 12 extends from the pump-cylinder and has a branch pipe 13, which opens into a water-tank 14, and another branch pipe 15, which opens into the boiler 1. Check-valves 16 and 17 are arranged within the pipes 13 and 15, respectively, and are so constructed as to open and close simultaneously. A valve-casing 18 is arranged within the outlet-pipe 12 and a slide-valve 23 is located in this casing and is connected by means of a rod 19 with a piston 20, located within a cylinder 21. The slide-valve 23 has its upper end beveled and when raised permits the free passage of water from the pump-cylinder 8 to the pipe 15 or from the tank 14 to the pump-cylinder 8. When in this raised position, slide-valve 23 closes a pipe 31, which extends from the top of tank 14 to the top of valve-casing 18 and has a check-valve 32 therein for preventing the passage of water in one direction therethrough. A spring 22 is interposed between this piston and one end of the cylinder and serves to hold the rod 19 normally raised and the passage through the casing 18 normally registering with the outlet-pipe 12. A slide-valve 24, similar to the valve 23, is arranged within a pipe 25, which extends from an oil-tank 26 to the burner 4, and this slide-valve has a rod 27 extending therefrom into the path of a bracket 28, secured to the rod 19. A spring 29 is provided for the valve 24 for the purpose of holding the same normally open.

It will be seen that when steam is generated within the boiler 1 it will pass outward through the pipe 30 into the cylinder 21, and when a predetermined pressure is produced the piston 20 will be moved therein, thereby tensioning the spring 22 and closing the valve 23. When the valve 23 is in this lowered position, however, it permits water to pass from the pump-cylinder 8 upward through pipe 31 to tank 14. Any water which may be held within the cylinder 8 during the downward stroke of the piston 9 is thus permitted to escape, and injury to the mechanism is prevented. Water will thus be cut off from the pump and tank to the boiler 1; but should the pressure within the boiler continue the same or increase the rod 19 will continue in its downward movement and bring bracket 28 against rod 27, thereby closing the valve 24 and shutting

off the supply of fuel. This downward movement of rod 27 will compress the spring 29. When the pressure has been reduced, springs 22 and 29 will return their parts to their normal position. The upward movement of piston 9 in cylinder 8 will draw water from tank 14 into the cylinder and will close the check-valve 17, and the downward movement of piston 9 will close the valve 16 and force the water outward into pipe 15 and the boiler 1.

It will be seen that this mechanism is extremely simple in construction and will automatically regulate the pressure within the boiler and keep said boiler supplied with water at all times.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing any of the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

Having thus described the invention, what is claimed as new is—

1. The combination with a boiler having a burner; of a water and a fuel tank, a connection between the fuel-tank and the burner, a slide-valve therein, a rod extending from the valve, a pump having an outlet, a slide-valve within the outlet, valved connections between the outlet and the water-tank and boiler, respectively, a cylinder communicating with the boiler, a spring-pressed piston within the cylinder and connected to the valve in the outlet, and a bracket movable with the spring-pressed piston and the valve in the outlet, and adapted to contact with and operate the rod.

2. The combination with a cylinder having a steam-inlet, and a spring-pressed piston within the cylinder; of a pump having an outlet, a valve within the pump, a connecting device between the valve and piston, a bracket extending from said device, a water-tank, valved connections between the outlet and the tank and the point of discharge, respectively, a fuel-tank having an outlet, and a valve within the outlet and adapted to be operated by the bracket.

3. In a device of the class described, a steam-generator provided with a burner, a water-supply duct leading to the generator, a fuel-supply duct leading to the burner, said ducts having controlling-valves, a cylinder connected with the generator to receive steam therefrom, a piston movably disposed within the cylinder and connected with the valve in one of the ducts, a fixed member carried by and movable with the piston, and an element connected with the valve in the other duct and disposed within the path of movement of the member.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES E. HASTINGS.

Witnesses:

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J. M. HUNTER.