

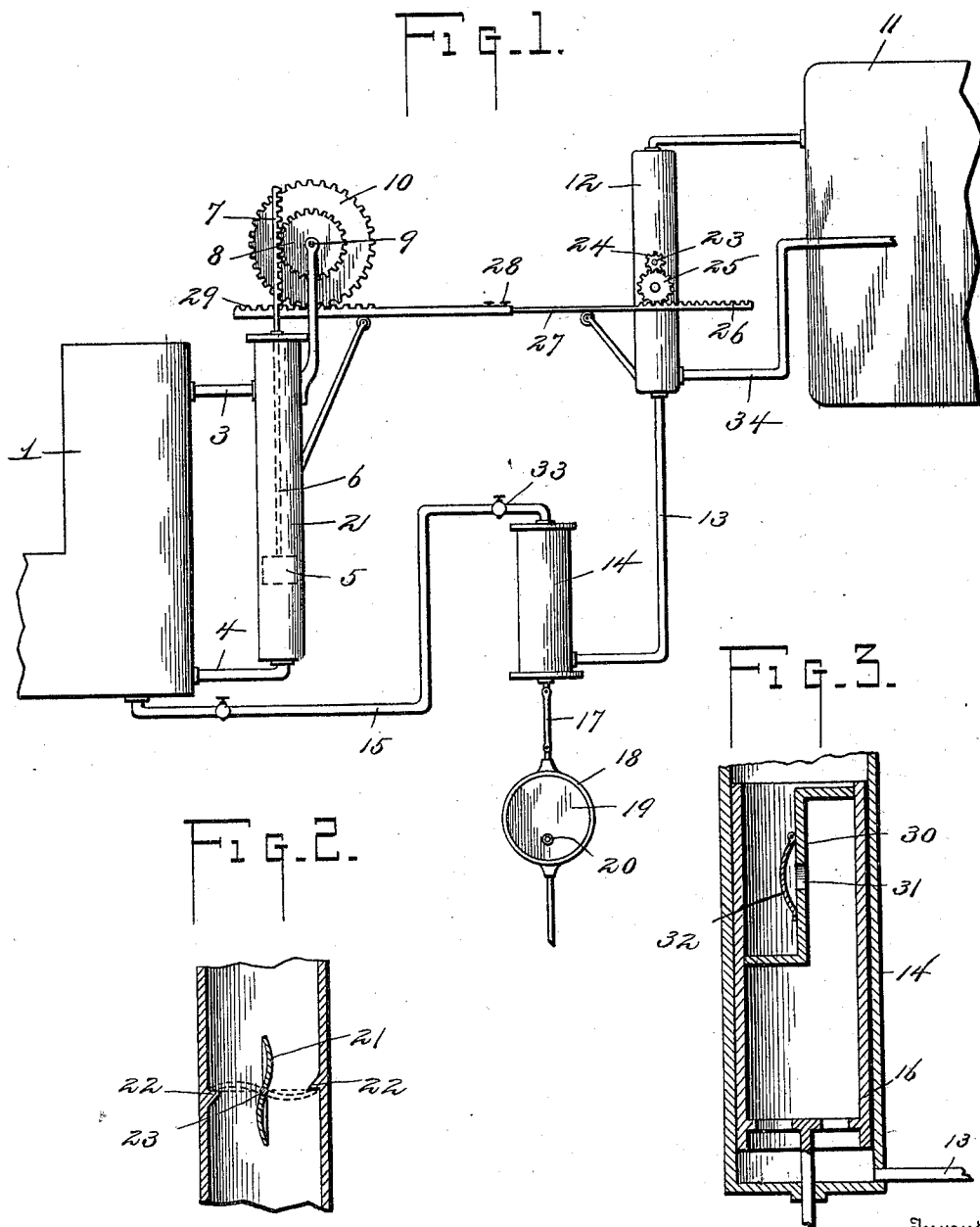
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Patented May 9, 1899.

E. W. MARSH.
FEED WATER REGULATOR FOR BOILERS.

(Application filed Oct. 1, 1898.)

(No Model.)



Witnesses

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UNITED STATES PATENT OFFICE.

ERNEST WEYMOUTH MARSH, OF CAROLINA, WEST INDIES.

FEED-WATER REGULATOR FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 624,836, dated May 9, 1899.

Application filed October 1, 1898. Serial No. 692,412. (No model.)

To all whom it may concern:

Be it known that I, ERNEST WEYMOUTH MARSH, a subject of the King of Denmark, residing at Carolina, via St. Thomas, Danish West Indies, have invented certain new and useful Improvements in Feed-Water Regulators for Boilers, of which the following is a specification.

This invention relates to feed-water regulators for steam-boilers, the object of the same being to provide means whereby the level of water in the boiler will be maintained stationary at all times.

A further object of the invention is to provide means whereby the necessity of forcing cold air into the boiler from the supply-pump will be avoided when the water is at its proper level in the boiler and none is supplied to the pump.

The invention consists of the construction, combination, and arrangement of parts, which will be hereinafter more fully described and claimed.

In the drawings forming a part of this specification, Figure 1 represents a general view of the parts of the device with which my invention is employed. Fig. 2 is a detail sectional view of the supply-pipe, showing the cut-off valve therein. Fig. 3 is a similar section through the pump-casing and the plunger therein.

Like reference-numerals indicate like parts in the different views.

In connection with the boiler 1 of ordinary construction is employed a float-chamber 2, communicating with said boiler at its upper and lower ends through the pipes 3 and 4, respectively. Within said chamber is a float 5, whose stem 6 extends upwardly therefrom, and projects beyond the head of said chamber, and is provided with rack-teeth 7, which mesh with a pinion 8, mounted upon a shaft 9 and having secured to it a cog-wheel 10. The water-tank 11 is located at a suitable distance from the boiler 1 and has leading therefrom a supply-pipe 12, which communicates from its lower end through a pipe 13 with a pump 14, having a pipe 15 leading from one end thereof into the boiler. The plunger 16 of said pump is operated continuously from a suitable engine or other motor and is preferably connected thereto by means of a rod 17,

attached to a strap 18, surrounding an eccentric 19 on the drive-shaft 20.

Within the water-supply pipe 12 is a swing-cut-off valve 21, adapted to engage with the shoulders 22 22, located upon opposite sides of said pipe and constituting the seats for said valve. The same is connected with a shaft 23, which extends through the pipe 12 and carries a pinion 24 upon its outer end, which meshes with a cog-wheel 25, the latter being in turn adapted to mesh with the rack-teeth 26 upon one end of a telescopic rod 27. The said rod 27 is made up of two sections adjustably connected together by means of the set-screws 28, the inner section being provided with rack-teeth 29, which mesh with the teeth upon the cog-wheel 10.

The pipe 13, leading from the supply-pipe 12, enters the pump-casing 14 at a point adjacent to one end thereof. The plunger 16 is provided with a central longitudinal diaphragm 30, having an aperture 31 therein, which is controlled by a valve 32, so that as the water is supplied to the pump it enters the hollow plunger 16 through one end thereof, lifts the valve 32, and passes through the opposite end thereof. The reverse movement of the plunger closes the valve 32 and causes the water to be forced through the pipe 15 into the boiler 1. In the pipe 15, adjacent to its point of connection with the pump 14, a check-valve 33 is employed for preventing back pressure from the boiler to the pump.

Leading from the exhaust of the engine and communicating with the supply-pipe 12 at a point near its lower end is an exhaust-steam-supply pipe 34, the same being designed for the purpose of supplying steam to the pump 14 when the water from the tank 11 is cut off by the valve 21, thereby avoiding the necessity of injecting cold air within the boiler from the pump, and thereby chilling the contents of the boiler.

From the foregoing description it is thought that the operation of my device will be readily understood. Briefly stated, however, it is as follows: Upon the recession of the level of water in the boiler 1 due to the generation and escape of the steam from the boiler the float 5 in the float-chamber 2 will recede or drop a corresponding distance. This action

causes a rotation of the cog-wheel 10 through the medium of the toothed float-stem 6 and the pinion 8. The movement of the cog-wheel 10 causes a longitudinal movement to be imparted to the telescopic rod 27, whose teeth 29 are in mesh therewith, and a rotation of the cog-wheel 25, which meshes with the teeth 26 on the opposite end of said rod. A rotation of the cog-wheel 25 through the pinion 24 opens the cut-off valve 21 and permits the water in the tank 11 to pass down through the pipes 12 and 13 into the pump-casing 14. Arriving at the latter point, the same is instantly forced into the boiler 1 through the pipe 15, causing the return of the water within said boiler to its original level. During the upward movement of the water in the boiler as the feed-water is supplied thereto a reverse operation to that just described takes place, the valve 21 is closed, and the supply of water from the tank 11 to the pump 14 is cut off. Thereafter the pump in its operation supplies steam through the pipe 34 instead of cold air to the boiler, thereby avoiding the chilling of the contents thereof.

The rod 27 is made telescopic in order that the two members thereof may be so adjusted

as to operate the valve 21 just a sufficient distance to open or close the same during any variation of the level of the water within the boiler.

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

In a feed-water regulator for steam-boilers, the combination with the boiler and a supply-tank therefor, of a float-casing in communication with said boiler, a pump for supplying water to the boiler, a supply-pipe leading from the tank to the pump, a swinging cut-off valve in said supply-pipe, a pinion upon the shaft to which said valve is secured, a cog-wheel meshing with said pinion, a float within the float-chamber whose stem is provided with rack-teeth meshing with a pinion, a gear-wheel secured to the last-mentioned pinion, and a telescopic rod having rack-teeth thereon which mesh with both of said gear-wheels.

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

ERNEST WEYMOUTH MARSH.

Witnesses:

JULIUS LORENTZEN,
JAMES HENRY.