B. SIMONIDES.

AUTOMATIC FEED DEVICE FOR STEAM BOILERS.

APPLICATION FILED SEPT. 13, 1907.

910,872. Patented Jan. 26, 1909.

Fig. 2.

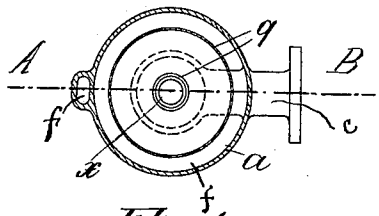
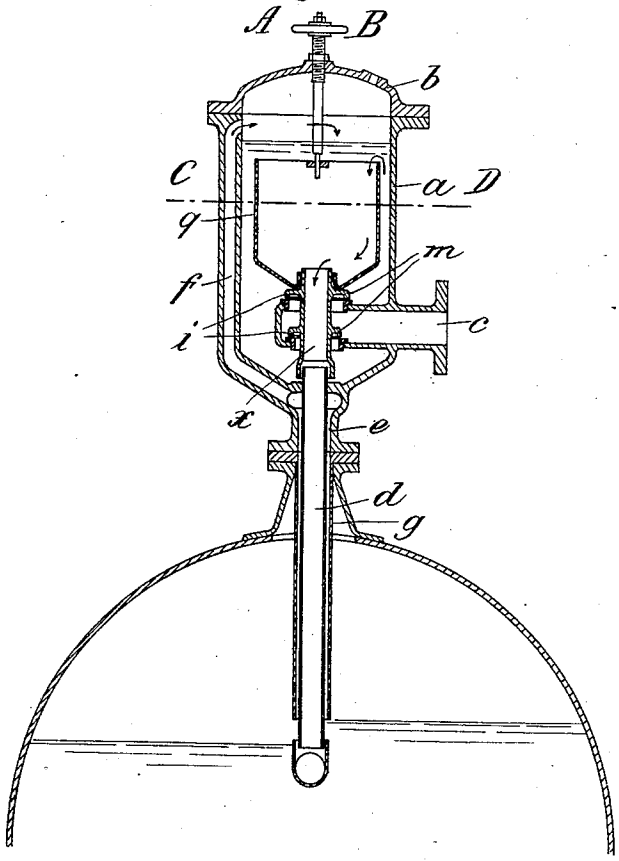


Fig. 1.



WITNESSES

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AUTOMATIC FEED DEVICE FOR STEAM-BOILERS.

No. 910,872. Specification of Letters Patent. Patented Jan. 26, 1909.

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To all whom it may concern:

Be it known that I, BRUNO SIMONIDES, a subject of the King of Prussia, residing at Gleiwitz, in the Kingdom of Prussia and German Empire, have invented a new and useful Improvement in Automatic Feed Devices for Steam-Boilers, of which the following is a specification.

My present invention relates to an automatic feed-device for steam boilers, which enters into operation automatically as soon as the water level in the boiler has sunk below a certain height. Such apparatus already exist and consist substantially of a receiver over the boiler in connection with the feed-pipe, which receiver is connected with the interior of the boiler by two pipes, one of which serves to conduct the water into the boiler and accordingly projects any desired distance into the water space, while the length of the other pipe is so chosen that its lower end corresponds with the medium water level of the boiler. In the top of the receiver is provided a float which acts in a suitable manner on a valve in the water supply pipe. As soon as the steam pipe from the said receiver is closed by the water in the boiler so that the said receiver is cut off from the steam of the said boiler, the steam on the top of the water partially condenses owing to its contact with the water, so that there is then less pressure in the receiver than in the boiler and no water can enter the boiler. Fresh water then flows into the receiver through the supply pipe until the valve closes, thereupon the pressure in the top of the receiver becomes equal to the steam-pressure of the boiler, less the weight of the water-column between the level of the water in the boiler and of that in the receiver. As soon as the water level of the boiler has sunk below the lower end of the steam-pipe leading to the receiver, steam passes to the top of the latter, producing the same pressure there as in the boiler. The water in the said receiver therefore passes through the longer pipe into the boiler and the float, sinking with the water-level in the said receiver, opens the valve so that fresh water will flow in until the water in the boiler again reaches the proper level and closes the bottom end of the steam-pipe. The above described operation is then repeated. This is the principle of all existing apparatus of the kind.

The novelty of the present invention lies firstly in the unusually compact arrangement of the various parts, secondly and chiefly in the use of an inverted bell as a float. In all constructions hitherto known in which a closed float is used, a leak in this latter at once puts the apparatus out of order; the float fills with water and either does not act properly or else does not act at all. This inconvenience is avoided by substituting an inverted bell for the closed float.

Compared with such existing devices the subject of the present invention is characterized by greater simplicity of construction, by economy of space and consequently also by cheapness, and finally by the absence of a closed float, which is so often the cause of a hitch in the working of the apparatus. Owing to this extremely compact arrangement the device can be attached to all existing boilers.

The invention is illustrated in the accompanying drawing, in which—

Figure 1 is a longitudinal section through the apparatus, in which the float is connected with valves controlling the water-supply, on the line A—B, Fig. 2. Fig. 2 is a section on the line C—D of Fig. 1.

a is the water-receiver, which is secured to the boiler by the flange-pipe *e* and has a flange-pipe *c* at the side for attaching to the water-pipe. The said receiver is closed at the top by a removable lid *b*. To the flange *e* is connected a steam-pipe *g*, which reaches down to the medium water-level of the boiler. Inside this pipe and the flange-pipe *e* is disposed the water-pipe *d*, which is secured in the flange-pipe *c*. The flange-pipe *e* is in communication with the channel *f*, which opens out at the top into the receiver *a*. *i* is the seat of the valve provided for the flange-pipe *c*.

The water-pipe *d* is not led up to the water level but ends underneath the side water-feed flange-pipe *c* and is continued by a second pipe placed thereon which is constructed in the form of a valve, having two flanges *m* adapted to fit seats *i* in the supply-pipe, through which the said pipe *x* projects. The top end of this pipe *x* opens into an inverted bell *q*. In the lid *b* of the receiver

there is a screw-spindle which projects through a transverse bar in the bell, so that by adjusting the spindle by means of the hand-wheel the stroke of the bell can be controlled.

The operation of this device is as follows: As soon as the water level has fallen to such an extent in the boiler that the bottom end of the steam-pipe *g* is opened, so that steam can pass from the boiler into the receiver, the water in the pipe *d* and bell *q* will flow into the boiler. As a consequence the buoyancy of the water in the receiver will raise the bell *q* and the pipe *x* so that water will then enter through the inlet-pipe *c*. The bell *q* is raised as far as the spindle will allow and the spindle is so adjusted that the bottom end of the pipe *x* is not raised over the top end of the pipe *d*. The feed-water is thereupon compelled to rise outside the bell and flow over the edge of the same into the interior and from thence into the boiler. As soon as the water-level in the boiler has risen to such an extent that the bottom of the steam-pipe *g* is closed, no more water can enter the boiler through the pipe *d*. The interior of the bell *q* and the pipe *d* will then be filled up with water so that these parts will sink and cut off the further supply. The weight of the pipe *x* and bell *q* is so chosen that it slightly exceeds the pressure of the feed-water on the surface of the valve. In this way it is assured that the water entering the boiler always presents a larger surface to the steam.

What I claim and desire to secure by Letters Patent is:—

An automatic feed-device for steam-boilers, comprising in combination a receiver arranged over the boiler, a pipe leading from the said receiver into the water-space of the boiler, a second pipe projecting through the supply pipe in the said receiver in continuation of the said first pipe, flanges on the said second pipe, valve seats in the said supply pipe adapted to be engaged by said flanges, and an inverted bell in continuation of the said second pipe, acting as a float to lift the said second pipe and the flanges thereon, and a pipe surrounding the said first pipe and connecting the top of the said receiver with the desired water-level of the boiler, substantially as, and for the purpose set forth.

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Witnesses:
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