

No. 788,725.

PATENTED MAY 2, 1905.

T. C. LORENZEN.  
AUTOMATIC FEED REGULATOR.

APPLICATION FILED AUG. 5, 1904.

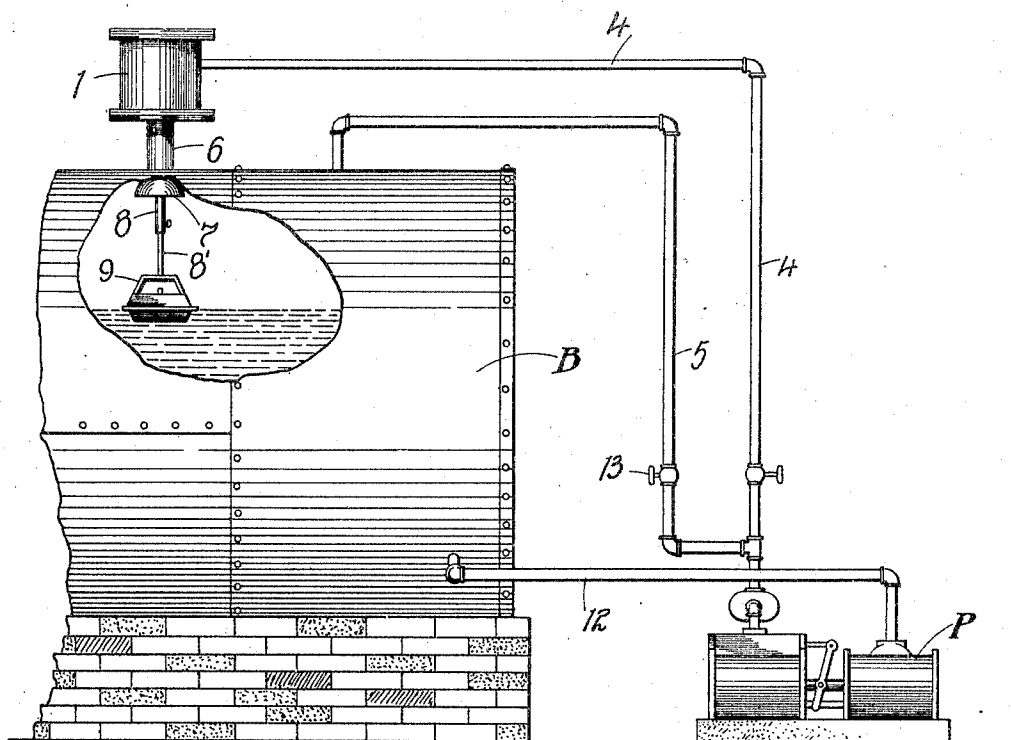


FIG. 1.

FIG. 3.

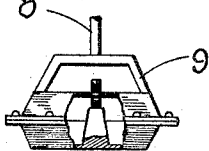
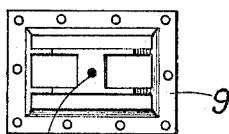


FIG. 4.

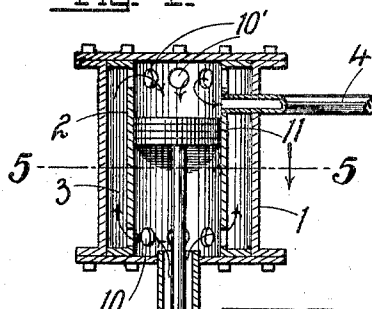


FIG. 2.

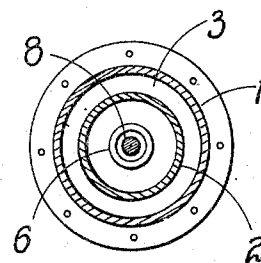
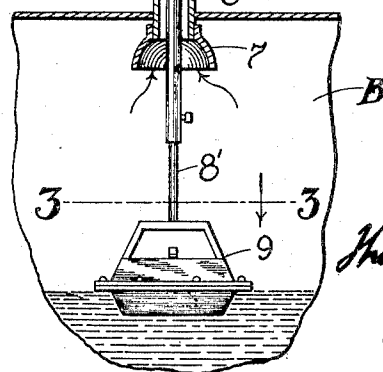


FIG. 5.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

THOMAS C. LORENZEN, OF BROOKINGS, SOUTH DAKOTA.

## AUTOMATIC FEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 788,725, dated May 2, 1905.

Application filed August 5, 1904. Serial No. 219,654.

*To all whom it may concern:*

Be it known that I, THOMAS C. LORENZEN, a citizen of the United States, residing at Brookings, in the county of Brookings and State of South Dakota, have invented certain new and useful Improvements in Automatic Feed-Pump Regulators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in automatic feed-pump regulators; and it consists in the novel construction and arrangement of parts more fully set forth in the specification and pointed out in the claim.

In the drawings, Figure 1 is an elevation of my regulator connected to a boiler and pump, respectively. Fig. 2 is a middle vertical section of the same. Fig. 3 is a horizontal section on line 3 3 of Fig. 2. Fig. 4 is an elevation of the float, and Fig. 5 is a horizontal section on line 5 5 of Fig. 2.

The object of my invention is to construct a regulator which shall be responsive to a predetermined level of the water in the boiler, said level being determined previously by the engineer, so that in the event the water in the boiler drops below this level the pump will be immediately set into operation and the level restored.

A further object is to construct a regulator which shall be simple, contain a minimum number of parts, and be reliably responsive.

In detail the invention may be described as follows:

Referring to the drawings, B represents a boiler, and P a conventional feed-pump. The regulator comprises an outer casing 1 and an inner cylinder 2, separated from the walls of the casing by an annular chamber 3. Leading from the cylinder through the wall of the outer casing to the pump is a steam-supply pipe 4, to the lower end of which is coupled the corresponding end of an emergency steam-pipe 5, leading from the boiler. Depending from the lower head of the cylinder is a guide-tube 6, having a flaring mouth 7 within the boiler, said guide-tube serving to guide the upper section 8 of the piston-rod, the said section telescoping with the lower section 8', to

which the float 9 is secured. In this way the length of the piston-rod may be adjusted so as to permit the device to respond to any predetermined level of water in the boiler. The lower peripheral wall of the cylinder is provided with a series of openings 10 and the opposite end with a series of openings 10', and between these two series operates the piston 11. The float is preferably made of two sections in the manner indicated in Fig. 4, though of course any form of float is available.

In the operation of the device steam from the boiler passes around the piston-section 8 within the guide-tube 6 below the piston, the steam then passing through the openings 10 into the chamber 3, thence above the piston through the openings 10', (the pressure below and above the piston being thus equalized,) then through the pipe 4 into the pump-cylinder, setting the pump into operation and feeding the boiler through feed-pipe 12. When the water in the boiler rises to a predetermined level, (a level determined by the length of the telescoping piston-sections to which the float is secured,) the float will force the piston upwardly until the openings 10' are closed thereby, when the pump will come to a standstill. The moment, however, that the water-level drops the piston drops with it and immediately the pump is set into operation, so that the device is automatic. In the event that the regulator is out of order the engineer may operate the pump by availing himself of the steam furnished by the pipe 5. The latter is provided with the necessary valve 13 to turn the steam on.

I may of course depart in a measure from the details here shown without in any wise affecting the nature or spirit of my invention.

Having described my invention, what I claim is—

A feed-pump regulator comprising an outer casing, an inner cylinder located therein and separated from the walls thereof by an annular chamber, the opposite ends of the peripheral walls of the cylinder being provided with openings for the free passage of steam into and out of said chamber, a steam-pipe leading from said cylinder through the walls of the casing to a suitable pump, a piston oper-

ating within the cylinder between the two series of openings aforesaid, a piston-rod adjustable lengthwise carried by the piston, a float at the lower end of the piston-rod, a guide-tube secured to the boiler and serving to guide the piston-rod, and a flaring mouth within the boiler at the lower end of the guide-tube, the upper end of the latter communicating with

the interior of the cylinder, substantially as set forth. 10

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

THOMAS C. LORENZEN.

Witnesses:

T. S. JACKSON,  
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