E. C. da SILVA.

Feed-Water Regulating-Valve.

No. 208,992. Patented Oct. 15, 1878.

Fig. 2.

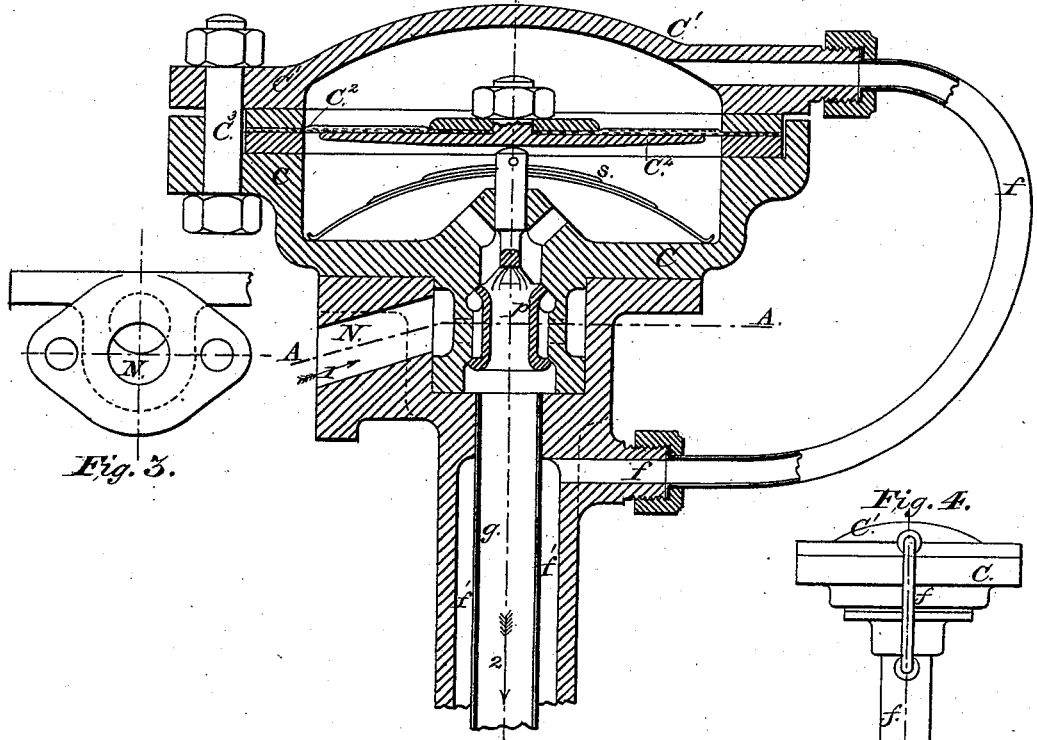


Fig. 3.

Fig. 4.

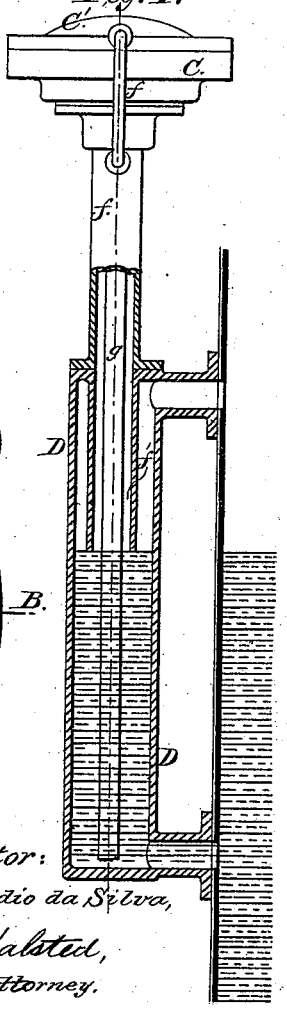
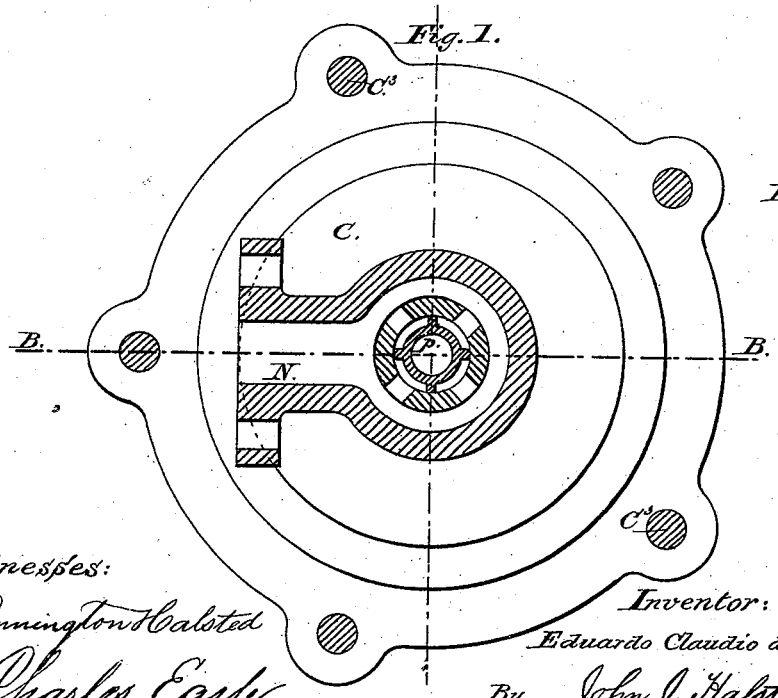


Fig. 1.



Witnesses:

Pennington & Halsted

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Inventor:

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By John J. Halsted,

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UNITED STATES PATENT OFFICE.

EDUARDO CLAUDIO DA SILVA, OF RIO DE JANEIRO, BRAZIL.

IMPROVEMENT IN FEED-WATER-REGULATING VALVES.

Specification forming part of Letters Patent No. **208,992,** dated October 15, 1878; application filed September 19, 1878; patented in England, February 3, 1877.

To all whom it may concern:

Be it known that I, EDUARDO CLAUDIO DA SILVA, engineer, of Rio de Janeiro, Brazil, have invented certain new and useful Improvements in Feed-Regulating Valves; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My improvements, which are in part patented in England, February 3, 1877, under the No. 460, relate to apparatus for regulating the supply of water to steam-boilers, and are at the same time applicable to regulate the discharge of water from steam-pipes or from steam-reservoirs.

In order that my improvements be clearly understood, I will describe in detail the construction and working of an apparatus embodying the said improvements and applied to regulating the admission of feed-water supplied to a boiler by any ordinary feed-pump, in conjunction with the four figures of the accompanying drawing, of which—

Figure 1 is a plan, in section, through A A, Fig. 2, looking upward; Fig. 2, a front elevation, in section, through B B, Fig. 1; Fig. 3, an elevation of the orifice of admission of the feed-water to the apparatus; and Fig. 4, a lateral elevation of the apparatus, partially in section and on a smaller scale, showing a mode of attaching the same to a boiler.

As shown in these figures, the apparatus consists in a metallic cylinder, C, closed above by a cover, C^1, a flexible diaphragm of caoutchouc or other appropriate material, C^2, being secured between the two parts by means of the bolts and nuts C^3. The upper face of this diaphragm is in connection with the level of the water-line by means of the pipe *f* and concentric passage *f'*, and its lower face is in connection with the water below the water-line by means of the central pipe *g*. Directly over this central pipe *g* there is a double-beat valve, *p*, to the stem of which is attached a spring, *s*, having a tendency to raise the valve up against its seats, while the upper end of its stem is in contact against a plate, C^4, screwed up against the under face of the diaphragm. This double-beat valve *p* admits or intercepts the feed-water (directed by a force-pump into the nozzle N) to the central pipe, *g*, according to whether the diaphragm is up or down in the cylinder C. For the purposes of inspection while under steam, cocks may be placed one in the upper T of the pipe, *g*, and another in the pipe *f*, by means of which the apparatus is disconnected from the boiler; but in such case it is advisable that these two cocks be connected so that they close and open together. The spring *s* serves to raise the valve *p* and the diaphragm when not acted on by the column of water in the central tube, *g*.

The action of this apparatus when used for regulating the supply of water to a steam-boiler is as follows: The diaphragm C^2 is drawn down in the cylinder C by the column of water in the central tube, *g*, the concentric passage *f'* being unsealed below and containing steam, the valve *p* being lowered, and consequently the apparatus is feeding. When not feeding, the diaphragm C^2 being pushed up by the spring *s*, as shown in Fig. 2, the lower end of the concentric passage *f'* being sealed by the water-line, the steam in it is condensed by the colder water in the central pipe, *g*, which is surrounded by the pipe *f'*. Consequently the water rises in *f'* and *f*, the double-beat valve *p* being thereby raised against its seats, intercepting the feed until, the water in the boiler falling again below the pipe *f'*, it is replaced by steam. Then the diaphragm C^2 is again drawn down by the column of water in the central pipe, *g*, and the apparatus commences to feed again, and so on, thus supplying water to the boiler immediately on the concentric pipe being unsealed, and arresting the said supply directly the water fed in the boiler reseals the said pipe. In order to avoid excess of pressure in the apparatus when closed, the feed-pump is provided with a relief-valve.

Fig. 4 shows one way of applying this apparatus to a boiler by setting it in a vertical pipe, D, with steam and water nozzles, and in such case I prefer, as a double security, to apply to this said vertical pipe D a glass water-gage of the usual construction.

When applied for regulating the discharge of water, this apparatus is arranged in such a manner that the double-beat valve *p* for the discharge of the water is open when the level of the water-line closes the extremity of the concentric tube *f'*, (being the reverse of the feed-regulator,) and closed when the water-line unseals the extremity of this pipe.

I claim as my invention—

1. The combination of the concentric pipes *f'* and *g*, for the purpose of admitting the feed-water to the boiler and of intercepting its passage thereto, arranged as shown and described.

2. The combination of the diaphragm C^2, in connection with the double-beat valve *p* and the spring *s*, for the admission and the interception of the said feed-water, constructed and arranged as shown and described.

EDUARDO CLAUDIO DA SILVA.

Witnesses:
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