

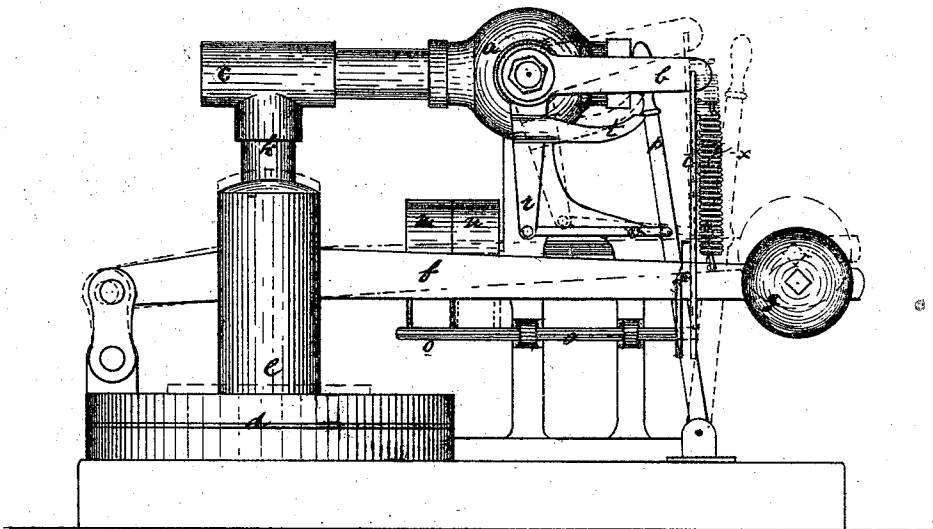
A. J. BALLARD.

Steam Pressure-Regulators.

No. 136,202.

Patented Feb. 25, 1873.

Fig. 1.



WITNESSES

Isaac W. Lansing.
Samuel W. Loring.

INVENTOR

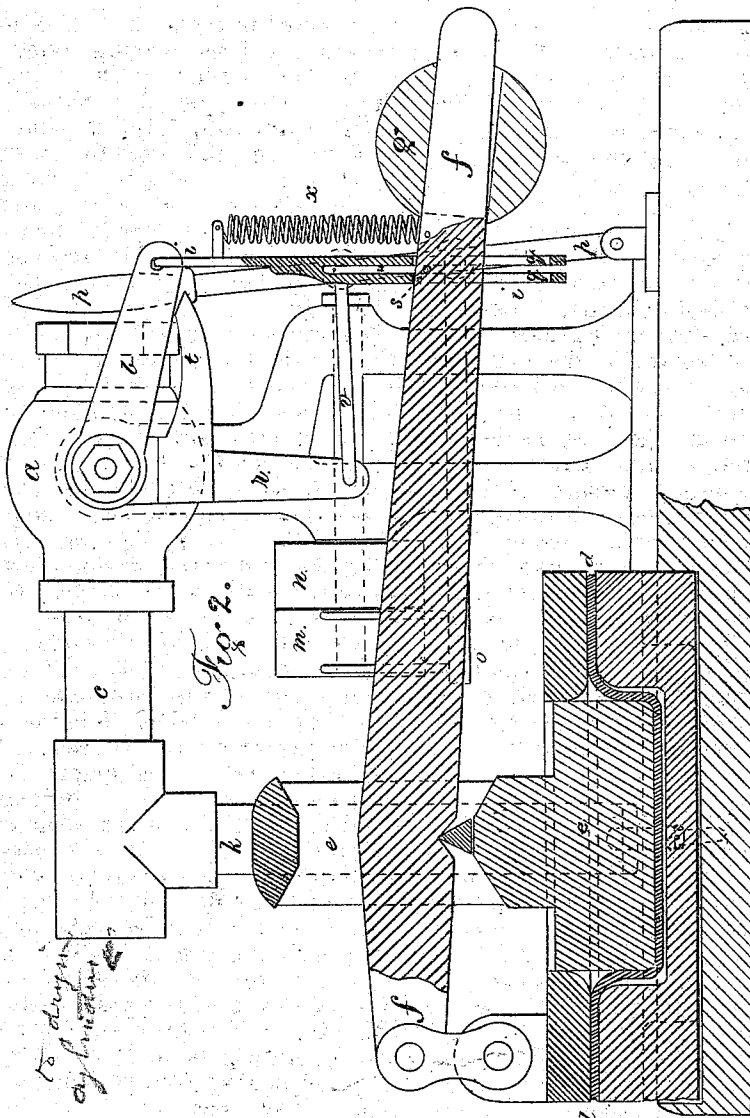
Andrew J. Ballard.

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Witnesses
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UNITED STATES PATENT OFFICE.

ANDREW J. BALLARD, OF COHOES, NEW YORK, ASSIGNOR TO UNION WATER-METER COMPANY, OF WORCESTER, MASSACHUSETTS.

IMPROVEMENT IN STEAM-PRESSURE REGULATORS.

Specification forming part of Letters Patent No. 136,202, dated February 25, 1873.

To all whom it may concern:

Be it known that I, ANDREW J. BALLARD, of Cohoes, county of Albany, State of New York, have invented a new and useful Improvement in Steam-Pressure Regulators, of which the following is a specification:

Object of the Invention.

When pressure-regulators are used in regulating the pressure of steam in drying-cylinders, such as are used in paper-machines, slashers, &c., it is desirable that, when the machine is stopped after having been started, the pressure of steam in the cylinders should be instantly reduced; otherwise the paper or yarn being manufactured becomes too dry, and vice versa, when the machine is again started to run, so that simultaneously therewith the required pressure shall be brought back to the cylinders. My invention consists in a new and peculiar arrangement and combination of devices, by means of which, when the machine is stopped, the valve in the pressure-regulator is closed, or nearly so; and when the machine is again started the valve is allowed to be controlled by the regulator, and the steam instantly brought back to the required pressure in such a manner that the goods being manufactured will be dried with perfect uniformity.

Description of the Accompanying Drawing.

Figure 1 is an elevation, and is designed to represent a pressure-regulator and the driving-shaft and pulleys of a slasher; also the shippers, levers, and other devices embodied in my invention.

a is the regulating-valve which governs or controls the amount of steam used as it passes through pipes *c* to the drying-cylinders, and is opened and closed by the rising and falling of the lever *b*, and is closed when in the position of the dotted lines, as shown. *c* is the steam-pipe which conveys the steam to the drying-cylinders. *d* is a diaphragm. *e* is the piston resting on the diaphragm. *k* is the pipe to convey steam or water to the diaphragm. *f* is the weighted lever; *g*, the weight to regulate the pressure on the diaphragm. *i* is a connecting-rod connecting lever *f* to valve-lever *b*, all of which, except rod *i*, are

constructed in the usual form of pressure-regulators. *m* is the driving-pulley on slasher; *n*, the loose pulley; *o*, the shipper-rod that ships the belt from the driving to the loose pulley, and is connected to handle *p* which is used to start and stop the machine in the usual manner. *r* is a lever hanging loosely on the hub or stem of valve *a*, and having an arm, *t*, extending out from it at nearly right angles, and so formed that when lever *p* is thrown forward the arm is brought in contact with valve-lever *b*, as is shown by dotted line. *v* is a rod connecting lever *r* to shipper-handle *p*. *x* is a spiral spring connecting valve-lever *b* to lever *f*, as shown. It will be seen that in rod *i* there is a slot from pivot *s* to end of rod, and that spring *x*, drawing upon levers *b* and *f*, holds the upper end of the slot *o* in rod *i*, through which the free end of lever *f* passes down upon the upper edge of the latter, and the side of guide-slot *u* against pivot *s*; or the upper end of slot *u* may be terminated at pivot *s* in Fig. 2 and made the bearing-point of rod *i* on lever *f*, instead of slot *o*, as shown in the drawing; but when shipper *p* is drawn over so as to ship the belt upon the loose pulley *n*, arm *t* is thrown up against valve-lever *b* and closes the valve, while the weighted lever *f* drops down in consequence of the reduced pressure of steam on the diaphragm, these motions of the levers *b* and *f* in opposite directions being allowed by the slots in the lower end of the rod *i*. In this connection also it is proper to state that the rod *v*, which connects the shipper-handle *p* to the lever *r*, should, as a rule, be made long enough not to entirely close the valve *a*, so as to allow steam enough to pass to keep the cylinder warm.

Fig. 2 represents a partial vertical section, the better to illustrate some of the working parts of the regulator.

Corresponding letters indicate the same parts in each view.

The operation is, then, as follows: Shipper-handle *p* being thrown forward to start the machine, valve *a* is opened by the force of spring *x*, and sufficient steam passes into the cylinder to dry the goods by the time the machine starts; then the valve is controlled by the diaphragm, and a uniform dryness is maintained. When the machine again stops the

valve closes, as before. Thus it will be seen that, with the weight *g* and rod *v* properly adjusted, though the machine is frequently stopped and started, the goods manufactured may be evenly dried to any degree of heat desired.

Claims.

Having described my invention, what I claim is—

1. The combination, substantially as described, of the slotted rod *i* and spring *x* with the levers *b* and *f*, for the purposes described.

2. The lever *p*, connecting-rod *v*, lever *r*, and arm *t*, in combination with lever *b* of valve *a*, as and for the purpose set forth.

3. The combination of the shipper-rod *o* and its actuating-lever with the adjustable pressure-lever *f* and valve-lever *b* of an automatic pressure-regulator, the whole operating in the manner and by means of devices substantially as described, for the purpose set forth.

ANDREW J. BALLARD.

Witnesses:

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