(No Model.)

J. WHEELER.

AUTOMATIC VALVE CONTROLLER.

No. 373,324. Patented Nov. 15, 1887.

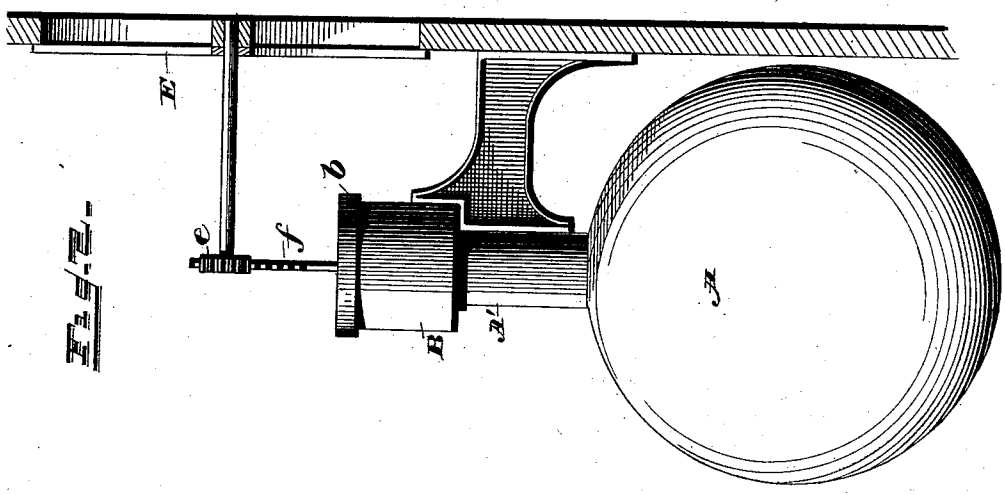


Fig. 1.

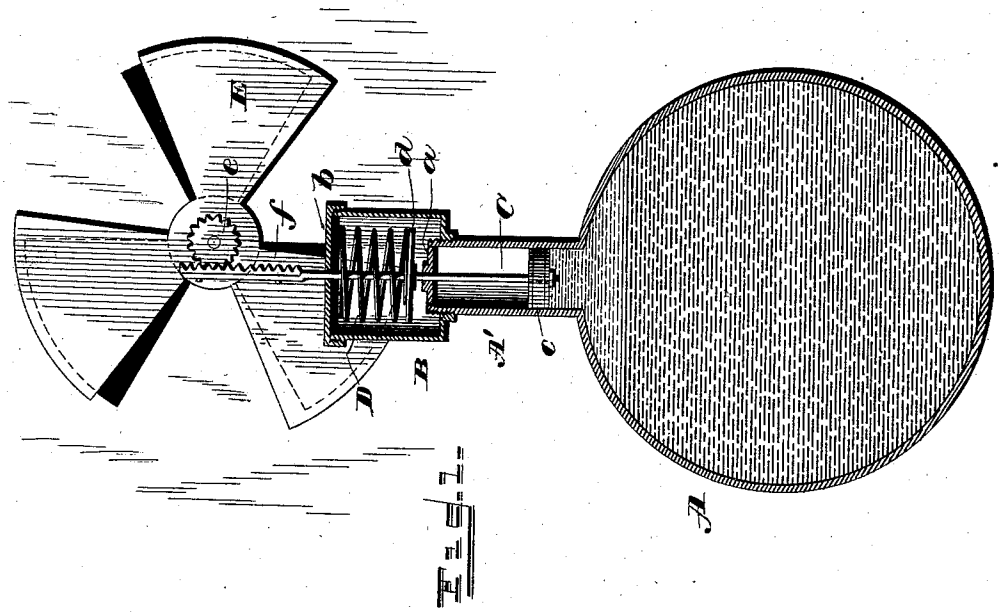


Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

JOHN WHEELER, OF EAST ST. LOUIS, ILLINOIS.

AUTOMATIC VALVE-CONTROLLER.

SPECIFICATION forming part of Letters Patent No. 373,324, dated November 15, 1887.

Application filed January 20, 1887. Serial No. 224,891. (No model.)

To all whom it may concern:

Be it known that I, JOHN WHEELER, a citizen of the United States of America, residing at East St. Louis, in the county of St. Clair and State of Illinois, have invented certain new and useful Improvements in Automatic Ventilators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as 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 letters or figures of reference marked thereon, which form a part of this specification.

My invention relates to certain new and useful improvements in devices for operating dampers, valves, &c., and for ventilating and heat-regulating purposes, the object of my improvement being to provide a means whereby a damper or ventilator will be opened and closed as the temperature in the room rises or lowers, said damper-regulating means being automatic.

With the above end in view my invention consists in the combination of a vessel which contains an expansible medium, said vessel having a cylindrical neck, above which is located a box containing a spring, said spring being adapted to bear upon a piston-rod so as to force the same downwardly, the piston being forced upwardly by the expansion of the material contained in the vessel, said piston-rod engaging with the ventilator.

My invention also consists in the construction and combination of the parts, as will be hereinafter fully set forth, and specifically pointed out in the claims.

In the accompanying drawings, which illustrate my invention, Figure 1 is a sectional view of a damper or ventilator operating mechanism constructed in accordance with my invention, and Fig. 2 is a side view.

A refers to a sphere of iron, glass, or other suitable material, which has formed thereon a cylindrical portion, A′, which is provided with a cap or cover, *a*, which has a central perforation, through which the piston-rod passes. The upper end of the cylinder A′ is screw-threaded, so as to engage with the screw-threads formed on the box B, these screw-threads forming means for connecting the box and cylinder to each other. As under varying conditions—as, for instance, the rusting of the bearings of the damper or the accumulation of dust therein—the spring power required to move the damper and piston will vary, I have connected the box proper, B, adjustably with the cylinder or neck A′ of vessel A, and also secure the cap *b* adjustably upon said box. By this means the tension of the spring can be readily increased when the necessity of the case demands it.

The box B is provided with a removable top or cover, *b*, which has a central opening which is on a line with the opening in the cap *a*. These openings or perforations serve as guides for a piston-rod.

To the piston-rod C, at a suitable distance within the box B, is secured a circular plate, *d*, upon which the lower portion of the spring D bears, the upper portion of said spring bearing upon the top *b* of the box B. The lower end of the piston-rod C is secured to the piston-head *c* in any suitable manner, and said rod is of sufficient length to engage a pinion, *e*, which is secured to a shaft which carries the damper E, said damper being of ordinary construction.

The upper portion of the piston-rod C is preferably reduced in size, so that it can be readily passed through the perforations in the tops *a* and *b*, and to said reduced portion is secured a rack-bar, *f*, which engages with a pinion, *e*.

The vessel A is partially filled with mercury, upon which is placed a suitable oil. The piston-rod C is then placed in the cylinder A′ so as to rest upon said oil, and the covers *a b* and box B are then secured in position. When the mercury expands, it forces the oil against the piston, so as to raise the same, which movement is imparted to the pinion, the effect being the opening of the damper E. After the temperature has fallen, the mercury will contract and the piston will be forced downwardly by the spring D, which bears upon the plate *d*, which is rigidly secured to the piston-rod, said spring serving to turn the damper in an opposite direction.

To operate a ventilator or damper the expansive force of mercury in vessel A must overcome the frictional resistance of the pis-

ton and the damper and the pressure of the spring. It is expedient to reduce friction as much as possible and to use a spring having normally just sufficient force to move the damper as the mercury contracts. For this purpose a seal of oil is interposed between the mercury and piston and constantly lubricates the piston, so that practically the only friction to be overcome is that caused by the movement of the damper; hence the spring need be only of sufficient tension to move said damper; but to render the device capable of operating the damper readily without expensive fitting or adjustment of the bearings or moving parts, the box B is made adjustable upon the cylinder A', whereby the spring may be compressed to increase its tension more or less, as required, thus exerting greater or less force to move the damper as special circumstances may require. Owing to this construction the device can be rendered very sensitive to slight changes of temperature.

This regulator is automatic in its operation and may be readily applied to either windows or to stoves and furnaces for operating the draft-dampers thereof, and it may be so adjusted that by the expansion of the liquid in the vessel A the dampers may be closed, or vice versa.

If desirable, suitable connections can be made between the piston-rod and the damper; and I do not wish to confine myself to the direct-acting movement shown in the accompanying drawings, as I may provide the hereinbefore-described automatic regulator with suitable means for carrying the movement of the piston-rod to a damper.

I claim—

1. The combination, with a damper, of a thermostatic regulator consisting, substantially as described, of a fixed vessel remote from and independent of the damper, provided with a cylindrical neck, and containing mercury or other expanding medium, a piston fitting within said neck, a box or casing secured upon the end of the neck, a spring arranged in the casing to hold the piston in contact with the expanding medium, and a rod connected to the piston and protruding through the box or casing to connect the piston with the damper.

2. In a thermostatic damper-regulator, the combination of the fixed vessel A, provided with a cylindrical neck threaded at its upper end and fitted with a cap, *a*, having a central opening, a box, B, interiorly threaded at its lower end and having at its upper end exterior threads, a screw-cap, *b*, having a central opening, a piston having its rod fitted with a fixed plate positioned within the box, a spring bearing at one end against said plate and at its other end against cap *b*, a damper, and means for controlling the damper by the movement of the piston-rod, substantially as described.

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

JOHN WHEELER.

Witnesses:
WILLIAM E. HENDER,
L. P. GANDILLOT.