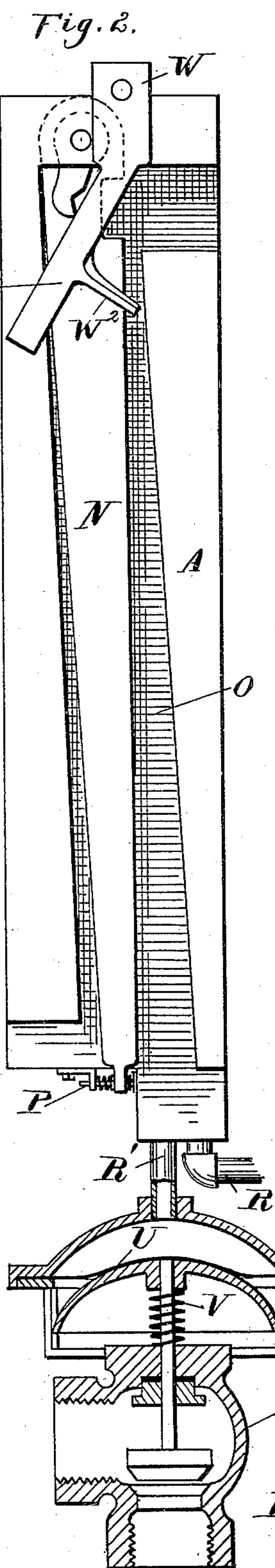
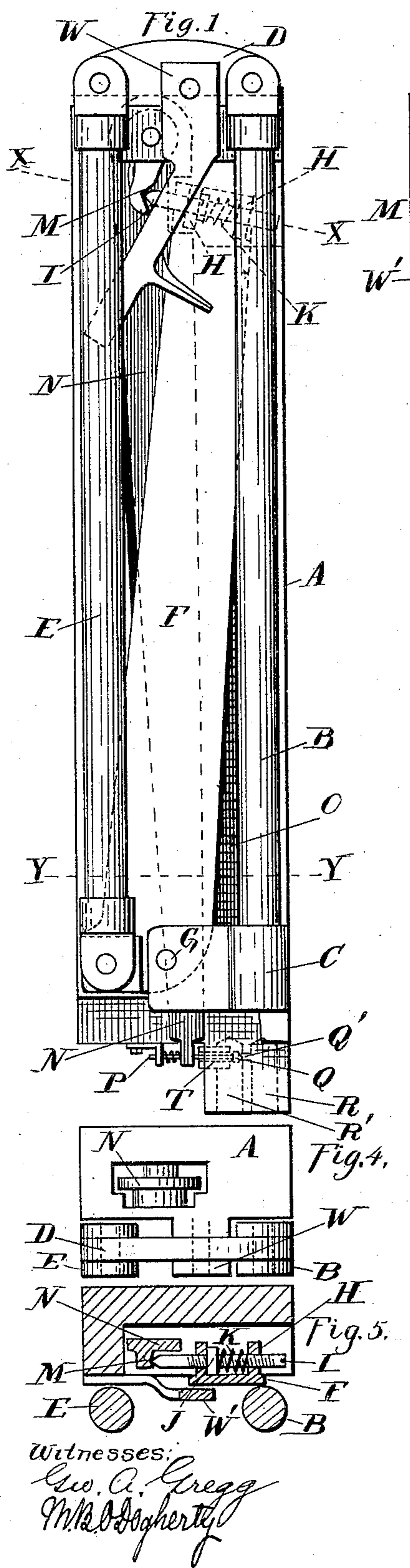


(No Model.)

J. F. McELROY.
TEMPERATURE REGULATOR.

No. 442,990.

Patented Dec. 16, 1890.



UNITED STATES PATENT OFFICE.

JAMES F. McELROY, OF ALBANY, NEW YORK, ASSIGNOR TO THE CONSOLIDATED CAR HEATING COMPANY, OF SAME PLACE.

TEMPERATURE-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 442,990, dated December 16, 1890.

Application filed May 1, 1890. Serial No. 350,174. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McELROY, a citizen of the United States, residing at Albany, in the county of Albany and State of New York, have invented certain new and useful Improvements in Temperature-Regulators, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to new and useful improvements in temperature-regulators; and the invention consists in the peculiar construction of the thermostat, consisting of expandible rods and connecting-levers adapted
15 to actuate a valve for controlling the supply of steam to the heating apparatus; and the invention further consists in the arrangement, combination, and construction of the parts, all as more fully hereinafter described.
20 In the drawings, Figure 1 is an elevation of my improved device. Fig. 2 is a similar elevation with some of the parts removed. Fig. 3 is a side elevation. Fig. 4 is a plan. Fig. 5 is a cross-section on line *x x* in Fig. 1, and
25 Fig. 6 is a cross-section on line *y y* in Fig. 1.

My device is especially designed for car-heating apparatus; but it may be applied to any place in which the temperature is desired to be regulated.

30 I have shown my thermostat as controlling a fluid-pressure apparatus which controls the steam-valve. It is evident that the thermostat may be made to operate the steam-valve directly, if desired.

35 A is the bed plate or base secured to the side of the car and supporting the operating parts.

B is an expandible rod, preferably of zinc, secured at its lower end in the lug C upon the
40 bed-plate and at its upper end pivotally engaging with one end of the multiplying-lever D, which at its other end is pivotally connected to a similar expandible rod E. The rod E at its lower end connects with the short
45 arm of the bell-crank lever F, which is pivoted at G to the lug C on the frame and extends vertically to the upper end of the bed-plate. At its upper end it is provided with the inwardly-projecting lugs H, apertured to
50 receive the adjusting-pin I, which engages by suitable screw-threads in the nut J, backed

by a spring K, which bears with one end against the nut and the other end against the inner side of the lug H. This adjusting-pin engages in the notched bearing M upon the
55 valve-operating lever N, which extends to the lower end of the machine through a suitable recess O, formed in the bed-plate. To the lower end of the lever N is secured the valve-stem P, which is held in suitable guides upon
60 the base-plate. This valve-stem at one end is provided with a double valve Q, adapted to close the passage Q' from the fluid-pressure pipe R, or to open said passage to connect
65 with the pipe R', connecting with the steam-valve S. Opposite the passage Q' is the exhaust-port T, formed around the stem P.

The parts being thus constructed, they are intended to operate as follows: Said parts being properly adjusted to effect the desired re-
70 sult, the expansion of the rod B is transmitted to the lever D, which multiplies its motion and imparts a reverse movement to the rod E, the expansion of which acts in the same direction as the impulse from the lever
75 D. The combined effect by the expansion of the two rods acts upon the bell-crank lever F to rock the same, and the motion of the lever F is imparted through the pin I to the bearing M of the lever N, which is vibrated
80 to the left, raising the valve Q to open the passage Q', and allowing the compressed air from the pipe R to enter through this passage into the pipe R', where it is carried above the diaphragm U of the steam-valve S
85 and closes said valve. The contraction of the parts causes a reverse movement, moving the valve Q to the right, closing the passage Q', opening the exhaust-port I, which exhausts the pressure upon the diaphragm and
90 allows the spring V to open the steam-valve.

The device may be adjusted by screwing in or out the pin I through the nut J. It will be seen that any undue expansion of the rods transmitted to the lever F will be taken up
95 by the spring K, the pin sliding freely through the lugs upon this lever.

W are lugs cast upon the bed-plate, between which the lever D is pivoted. W' is a brace for this lug having the guide-arm W''
100 for the lever F.

It will be seen that my expansion-rods and

the connecting-levers (excepting lever D) are all vertical, being supported upon their pivots, which construction gives the least possible lost motion in the parts and enables me to vibrate the actuating-levers with the least possible power.

What I claim as my invention is—

1. In a temperature-regulator, the combination, with a base-plate, of two expansible rods connected by a lever at one end, a bell-crank lever pivoted to the base adjacent to the lower ends of the rods, extending up in proximity to the opposite end of the base, and pivotally connected with the lower end of one of the rods, lateral lugs on the upper end of the bell-crank, a pin slidingly secured in the lugs, a spring on the pin, a valve-operating lever located in the rear of and parallel with the bell-crank, having a lug thereon with which the said pin engages, substantially as described.

2. In a temperature-regulator, the combination, with thermostatic rods and base, of a connecting-lever for the rods, a bell-crank connected with the opposite end of one of the rods, a lever on the base, a yielding connection between the same and the bell-crank, a valve at the lower end of the lever, and a valve-seat in which the valve works, substantially as described.

3. In a temperature-regulator, the combination, with the base, of two expansible rods, a lever connecting the same, a bell-crank pivoted to the base and one of the rods and extending up to a point near the upper ends of the rods, a reciprocating pin mounted on the upper end of the bell-crank, a tension-spring on the pin, a valve-actuating lever pivoted to the casing at its upper ends and extending below the same, and a fixed lug on the actuating-lever engaging with the pin, substantially as described.

4. In a temperature-regulator, the combination, with a recessed base or frame, of a valve-actuating lever pivoted to the frame located in the recess, expansion-rods on the frame, a lever connecting the same, a bell-crank pivoted on the frame at a point opposite the pivot of the actuating-lever, its end extending up and engaging the actuating-lever nearest its pivoted end, and springs at the end of the bell-crank and lower end of the actuating-lever, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 18th day of April, 1890.

JAMES F. McELROY.

Witnesses:

EDWIN A. SMITH,

HOMER J. NODINE.