J. W. BARTON.

DAMPER ACTUATOR.

APPLICATION FILED JUNE 11, 1908.

930,126. Patented Aug. 3, 1909.

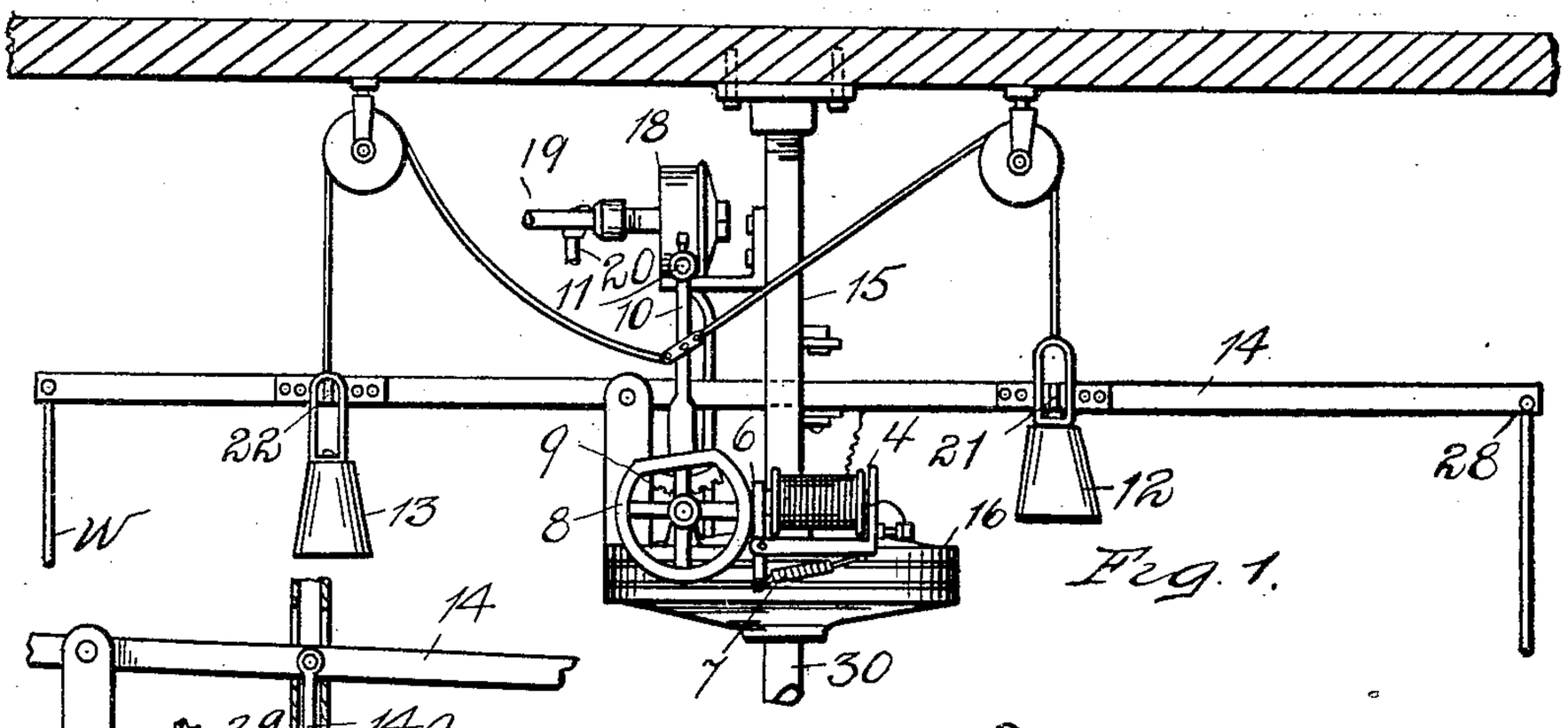

Fig. 1.

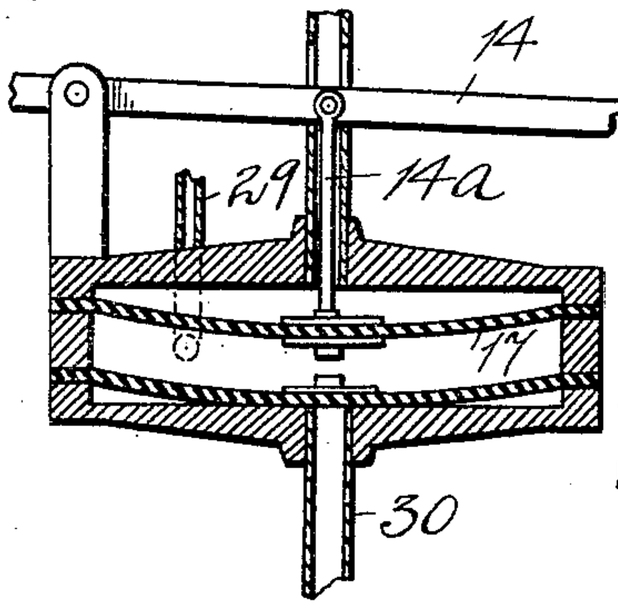

Fig. 2

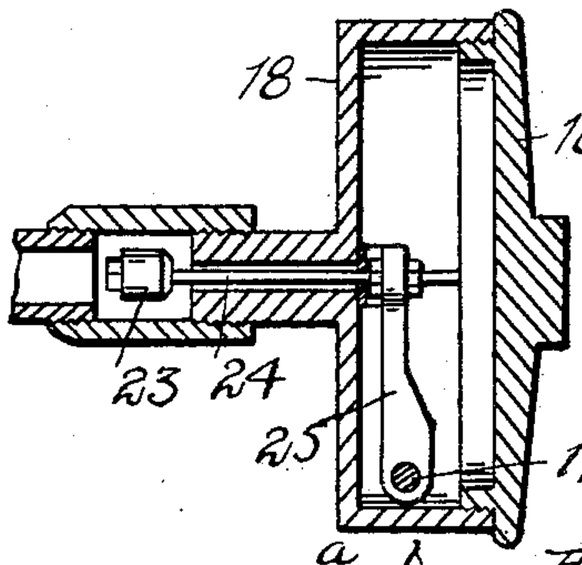

Fig. 3

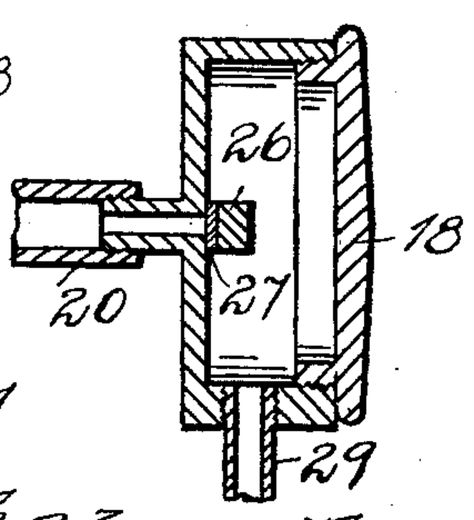

Fig. 4

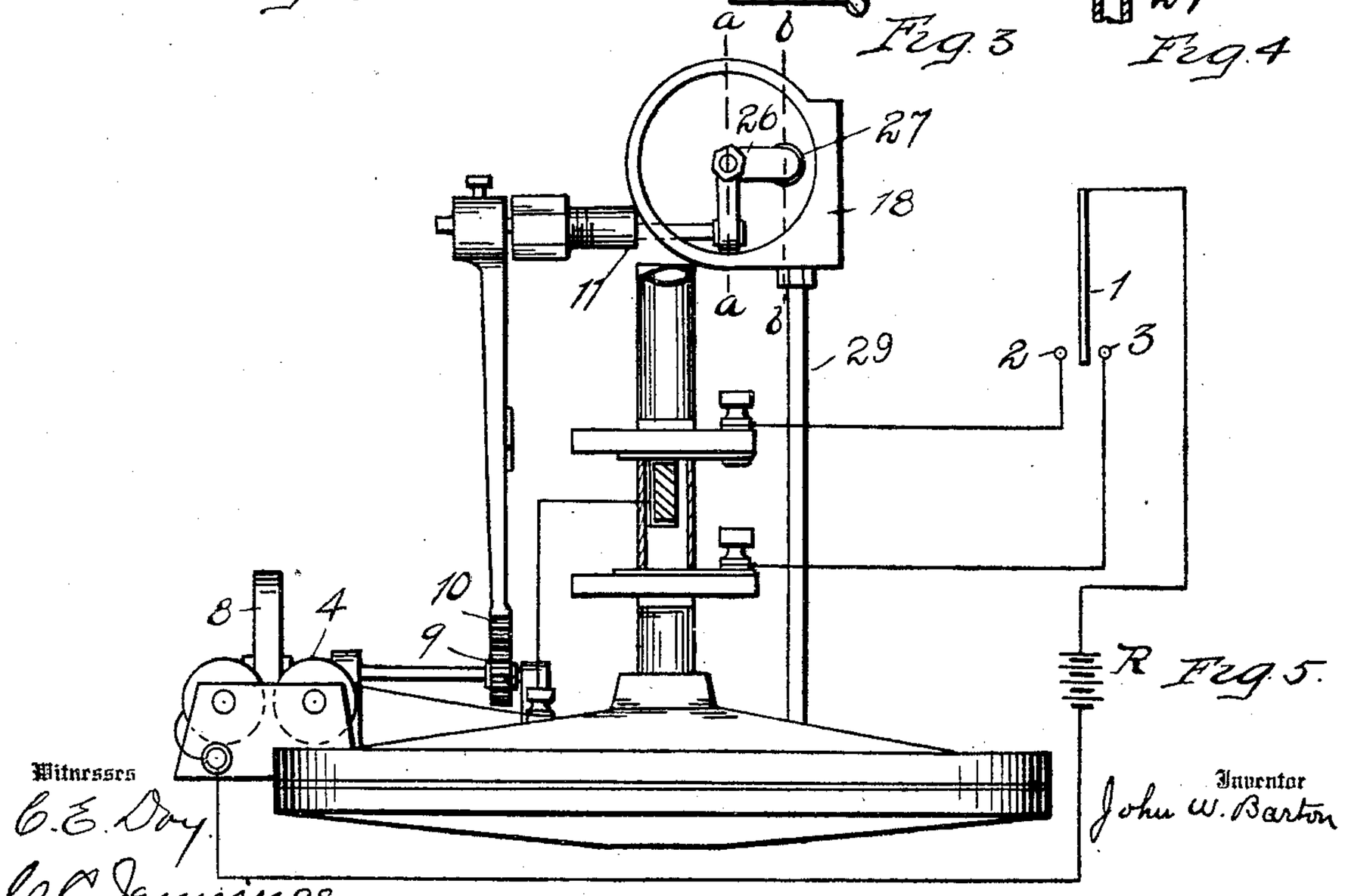

Fig. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN WILBERT BARTON, OF FLINT, MICHIGAN.

DAMPER-ACTUATOR.

No. 930,126. Specification of Letters Patent. Patented Aug. 3, 1909.

Application filed June 11, 1908. Serial No. 437,835.

To all whom it may concern:

Be it known that I, JOHN WILBERT BARTON, a citizen of the United States, residing at Flint, county of Genesee, State of Michigan, have invented a certain new and useful Improvement in Damper-Actuators, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to damper actuators.

It has for its object an improved damper actuating means to be used to operate dampers on steam, hot air, hot water furnaces, or transoms or valves by means of which the temperature of a room is controlled.

The special features of improvement will be described and pointed out in the claims.

In the drawings:—Figure 1, is a side elevation. Fig. 2, is a cross section of the diaphragm and its case. Fig. 3, is a vertical cross section of the water valve along the line *a*—*a* Fig. 5. Fig. 4, is a vertical cross section at the line *b*, *b*, of Fig. 5 of the water valve. Fig. 5 is an elevation of the diaphragm case, water valve and connections, part of the valve case being removed.

The damper actuating mechanism is itself controlled by fluid pressure, of which the action is controlled directly by weights, and indirectly by a magnet brake. The magnet itself is actuated by electric energy, controlled by a thermostat, and the thermostat is located in any room whose temperature is to be regulated.

1 indicates the thermostat; R the source of electric energy, and 2 and 3 indicate, respectively, the high temperature and low temperature connections. The circuit is closed in either case through a magnet coil 4, whose armature acts as, or is connected with, a brake 6, normally pressed by a spring 7 against a circular or wheel-like lever 8, on whose shaft is a pinion 9 that meshes with an oscillatory arm 10; the arm 10 depends from a valve stem 11, and has connected with it two weights 12 and 13, one of which is in actuating connection with the arm, and the other of which is in slack connection with the arm, and is for the time being, lifted out of its actuating position by the main damper throwing lever 14. The damper throwing lever 14 is supported by a hanger 15, which also supports a casing 16, within which is contained a flexible diaphragm 17. The hanger also supports a valve casing 18 into which enters an inlet pipe 19 for the passage of water from any suitable source of water supply, and from which leads an outlet pipe 20 for the escape of water that has previously actuated the diaphragm 17, and is then to be discharged. The main actuating lever 14 is provided with brackets 21 and 22, one of which engages through a link in the cord which sustains the weight 12, and the other of which engages through the link in the cord which sustains the weight 13. The length of the cords is so adjusted that one of these weights may be supported upon the bracket belonging to it, and at such times the other weight is free from the bracket and is supported by the cord to which it is attached, and because of its weight, tends to actuate the oscillating arm 10. The cords of both weights pass over suitable sheaves.

The action of the oscillating arm 10 on the valve will be best understood by examining Figs. 3, 4, and 5. The inlet passage for water is controlled by a valve 23, that seats against a seat 24 on a projection from the casing 18. The stem of the valve 23 has a reciprocating movement, and is actuated by an oscillating crank 25 on the shaft 11, which enters the casing near the bottom thereof, and is provided with a crank arm 25 that controls the movement of the stem of the valve 23, and also oscillates the valve 26, which closes over the seat 27 of the outlet pipe 20, both valves seat in a direction corresponding to the flow of the fluid.

The operation of the device is as follows:—Suppose the damper to be lifted, the damper acting as a weight on the end W of the lever 14. In this position the cord of the weight 13 is slack, the weight itself is held suspended by the bracket 22 that projects from the lever 14; the cord of the weight 12 is tight, but its actuating force is counteracted by the brake 6. When the temperature rises and causes the thermostat to close electrical contact, and draw the armature and brake away from the wheel-like lever 8, the weight 12 comes into action and oscillates the arm 10, pushes the valve 23 away from its seat, and closes the outlet valve 26 against its seat. Water now is free to flow into the diaphragm chamber, and does flow into the chamber below the diaphragm; lifts the diaphragm and lifts the end 28 of the lever 14. The weight

13 falls, and its cord tightens. Whenever the electric circuit is broken by the cooling of the temperature in the room, in which the thermostat is located, the brake comes into action against the lever 8. This continues until the temperature in the room has been reduced to an extent such that the thermostat makes connections through the other terminal or cool terminal, when the electric connection is again made, and the weight 13 opens the discharge valve, closes the inlet valve, and allows the counterweight on the arm 28 of the main arm to actuate the lever 14, and open the damper.

In Fig. 2 is shown a double diaphragm, having the inlet 29 for water connected with the chamber between the two diaphragms, and an inlet 30 for steam connected under the lower diaphragm; both diaphragms actuate the same plunger 14^a connected with the lever 14. The means for controlling the admission of steam are not shown, but may be of identical or similar character with those controlling the admission of water, and are used in connection with steam heating, while the present described apparatus is used in connection with either air or water heating.

What I claim is:—

1. In an automatic damper-controlling device, in combination with a pressure actuated diaphragm, a pivoted lever having a link connection therewith and adapted to be moved from its normal horizontal position by the movement thereof, means for conducting to said diaphragm a supply of actuating fluid, a pair of weight-actuated valves for controlling the inflow and outflow of fluid for acting upon said diaphragm, a lever member adapted to control the possible flowage speed through said valves, a normally open electric circuit adapted to be closed by an extreme temperature, whereby said last mentioned lever is actuated, and said valves are opened and closed accordingly, and a brake member adapted to be actuated by said electric circuit, indirectly controlling the actuation of the diaphragm by yieldingly opposing the operation of the valves, substantially as described.

2. In a temperature controlled damper, the combination of a pivoted lever linked to the damper, a pair of valves, means for conducting thereto a supply of motive fluid, interconnecting means between said valves whereby the movement of one imparts actuation to the other, a pressure actuated diaphragm adapted to be actuated by the motive fluid admitted through one of said valves, a link member connecting the same to one arm of said lever, for communicating thereto the movement of said diaphragm, an electric circuit adapted to be closed by extremes of temperature, and a brake apparatus controlled thereby, adapted to yieldingly oppose the actuation of the valves when the circuit is broken, substantially as described.

In testimony whereof, I sign this specification in the presence of two witnesses.

JOHN WILBERT BARTON.

Witnesses:
DWIGHT T. STONE,
FRANKLIN V. V. SWAN.