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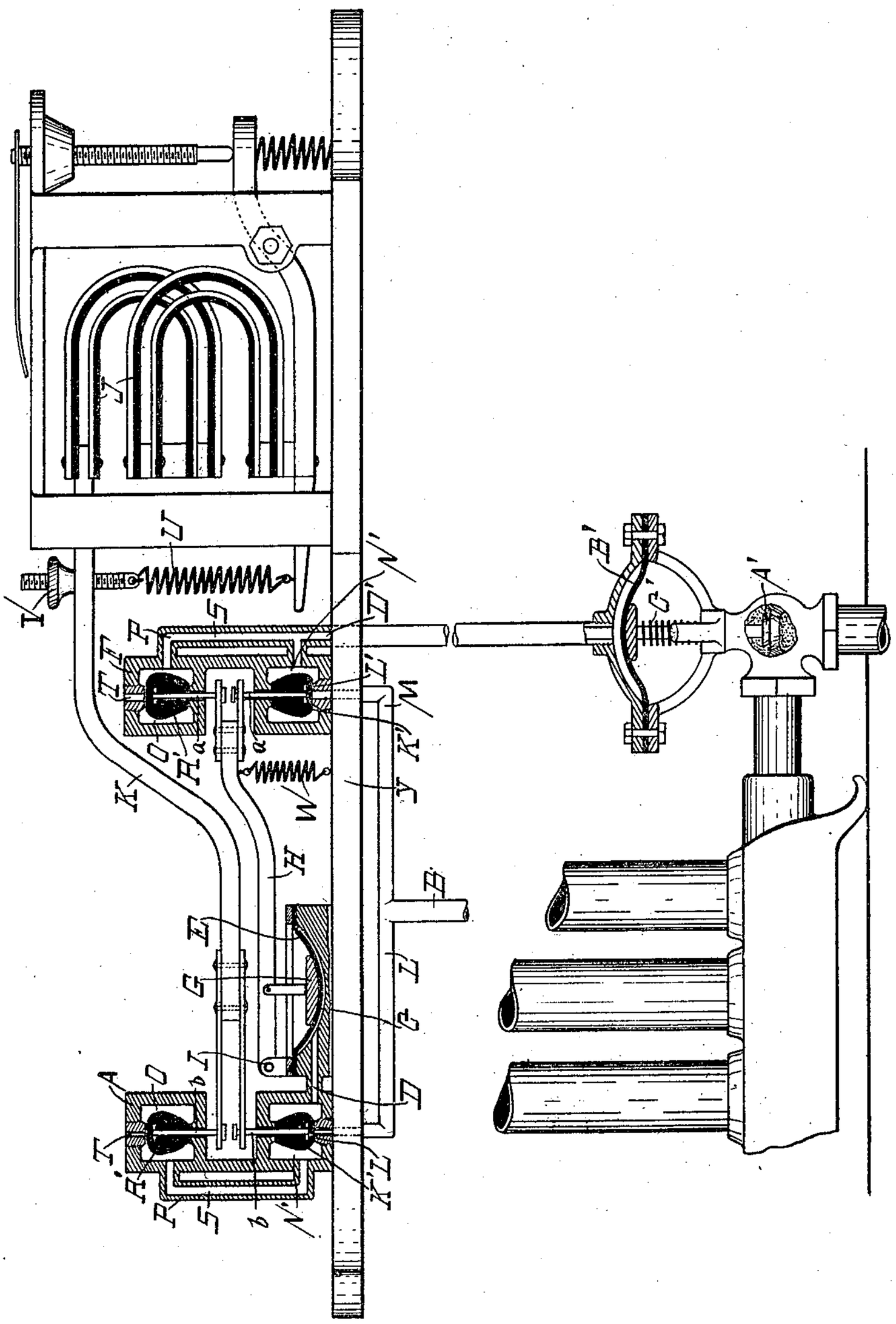
A. ROESCH.

TEMPERATURE REGULATING APPARATUS.

(Application filed June 7, 1897. Renewed Apr. 23, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

ALFRED ROESCH, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE DAVIS & ROESCH TEMPERATURE CONTROLLING COMPANY, OF NEW JERSEY.

TEMPERATURE-REGULATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 616,142, dated December 20, 1898.

Application filed June 7, 1897. Renewed April 23, 1898. Serial No. 678,580. (No model.)

To all whom it may concern:

Be it known that I, ALFRED ROESCH, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented new and useful Improvements in Temperature-Regulating Apparatus, of which the following is a specification.

My invention relates to improvements in air-controlling valve mechanism for that class of heat-regulating systems in which compressed air is employed as the actuating power for opening and closing the steam-controlling valves and the thermostat is employed for operating the air-controlling valves. The thermostat and primary air-controlling valve mechanism actuated directly thereby have previously been shown and described in the following United States Patents, which have been issued to me—to wit, Patents Nos. 583,632 and 583,633.

My present improvement pertains more especially to the combination, with the thermostat and the primary air-controlling valve mechanism, of a secondary air-controlling valve mechanism of larger capacity and an air-actuated diaphragm for actuating the secondary air-controlling mechanism, whereby larger air-valves may be used than can be operated by the thermostat alone.

The construction of my invention is further explained by reference to the accompanying drawing, which represents a vertical section of the air-controlling valve mechanism and diaphragm-chamber in connection with a thermostat and an air-actuated steam-controlling valve.

Like parts in the primary and secondary air-controlling valve mechanisms are represented by the same reference-letters.

A represents the primary air-controlling valve mechanism, through and by which compressed air is controlled in its passage from the inlet air-duct B to the diaphragm-chamber C. Air is led from the valve mechanism A to the diaphragm-chamber C through the duct D. As the compressed air enters the chamber C the diaphragm E is raised, whereby motion is communicated therefrom to the secondary air-controlling valve mechanism F through the diaphragm-plate G and lever H. The lever H is pivoted at one end to the standard I, while its opposite end is connected with the protruding valve-stems *a a* of the air-controlling valve mechanism F. Motion is communicated from a thermostat J, of any suitable construction, to the protruding ends of the valve-stems *b b* of the valve mechanism A through the lever K.

The air-controlling valve mechanisms A and F are both alike in construction and both alike control the admission and escape of air from the same air-duct B through the respective branch ducts L and M, and similar parts of such valve mechanisms are, as stated, described by the same reference-letters.

The admission and escape of air from the inlet air-duct L to and from the diaphragm-chamber C through the primary air-controlling valve mechanism A is controlled by the rise and fall of the lever K, which lever is actuated by the thermostat, while the admission and escape of air to the secondary air-controlling valve mechanism F from the air-duct M is controlled by the rise and fall of the lever H, which lever H is in turn actuated by the diaphragm E and diaphragm-plate G, as air is admitted to and discharged from said diaphragm-chamber C, and as the power of the diaphragm thus actuated by compressed air is much greater than that of the ordinary thermostat used for such purpose I am enabled by applying the power of the air through such diaphragm to the secondary valve-actuating mechanism to open and close much larger valves than could otherwise be employed for controlling the admission and escape of air.

The admission of air from the duct B to the respective air-controlling valve mechanisms A and F is controlled by the respective inlet-valves K′, which valves when in their normal condition are closed. When the respective valves K′ are raised by the action of their respective levers K and H, the air is permitted to enter the respective air-chambers N′ N′, when it passes from thence out through the respective outlet-ducts D and D′. The air passing from the duct D actuates the diaphragm E, as previously stated, while the air which passes out through the duct D′ actuates the diaphragm B′ and the steam-controlling valve A′, when by a reverse movement of the levers

K and H the respective valves K′ are both closed, while the respective valves R′ R′ are opened, whereby the air, which has done its work, returns through the respective ducts D D′ and passes up through the side ducts S S to the outlet-chambers O O, from which it escapes through the respective outlet-ports T T.

The lever K is provided with a tension-spring U, by which the resistance of the thermostat may be increased or diminished by turning the tension-screw V upward or downward.

The lever H is provided with a tension-spring W, the office of which is to draw the lever H downward with the diaphragm-plate G and diaphragm E, when the air beneath such diaphragm is permitted to escape. The spring W is attached at one end to the lever H and at its opposite end to the bed-plate Y.

It will be understood that the steam-controlling valve A′ is actuated through the diaphragm B′ in the ordinary manner, whereby the steam-valve is closed by the pressure of the air and opened as soon as the air is released by the action of the spring C′.

The valves K′ K′ and R′ R′ are elastic and of such dimensions that when in their normal condition they close the respective inlet and outlet ports, against which they are adapted to bear of their own elasticity, while they react against the bearings around their respective stems and close them against the escape of air, whereby the necessity of using packing around such valve-stems to prevent the escape of air is avoided. This construction of elastic valves is also shown in my prior patents, to which I have referred.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an air-controlling device for heat-regulating systems, the combination of a primary air-controlling valve mechanism, provided with an inlet air-duct, and both inlet and outlet air-controlling valves; a diaphragm and diaphragm-chamber; an air-duct communicating between said primary air-controlling valve mechanism and said diaphragm-chamber, whereby the air is caused to first pass through the primary valve mechanism, by which it is controlled, before it enters said diaphragm-chamber; a valve-actuating arm communicating from an actuating-thermostat with the protruding valve-stems of said air-controlling valves; a secondary air-controlling valve mechanism provided with an inlet air-duct, and inlet and outlet air-controlling valves; a diaphragm-plate and lever communicating between the diaphragm and the protruding valve-stems of said secondary air-controlling valve mechanism; an outlet air-duct communicating between said secondary air-controlling valve mechanism and the actuating mechanism of a steam-controlling valve, all substantially as and for the purpose specified.

2. In an air-controlling device for heat-regulating systems, the combination of a primary air-controlling valve mechanism, provided with an inlet air-duct, and both inlet and outlet air-controlling valves; a diaphragm and diaphragm-chamber; an air-duct communicating between said primary air-controlling valve mechanism and said diaphragm-chamber, whereby the air is caused to first pass through the primary valve mechanism, by which it is controlled, before it enters said diaphragm-chamber; a valve-actuating arm communicating from an actuating-thermostat with the protruding valve-stems of said air-controlling valves; a secondary air-controlling valve mechanism provided with air-controlling valves and an inlet air-duct, both of said inlet air-ducts to said air-controlling valve mechanisms being connected with a single supply-duct; a valve-actuating lever communicating from said diaphragm with the protruding ends of the valve-stems of said secondary air-controlling valve mechanism; a spring connected with the free end of said lever and the supporting bed-plate, said lever being adapted to be moved by the action of the air in one direction and the action of said spring in the opposite direction, as the air is permitted to enter and escape; an outlet air-duct communicating between said secondary air-controlling valve mechanism and the actuating mechanism of a steam-controlling valve, all substantially as and for the purpose specified.

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

ALFRED ROESCH.

Witnesses:
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